



THE MEDIEVAL LONGSWORD

NEIL GRANT





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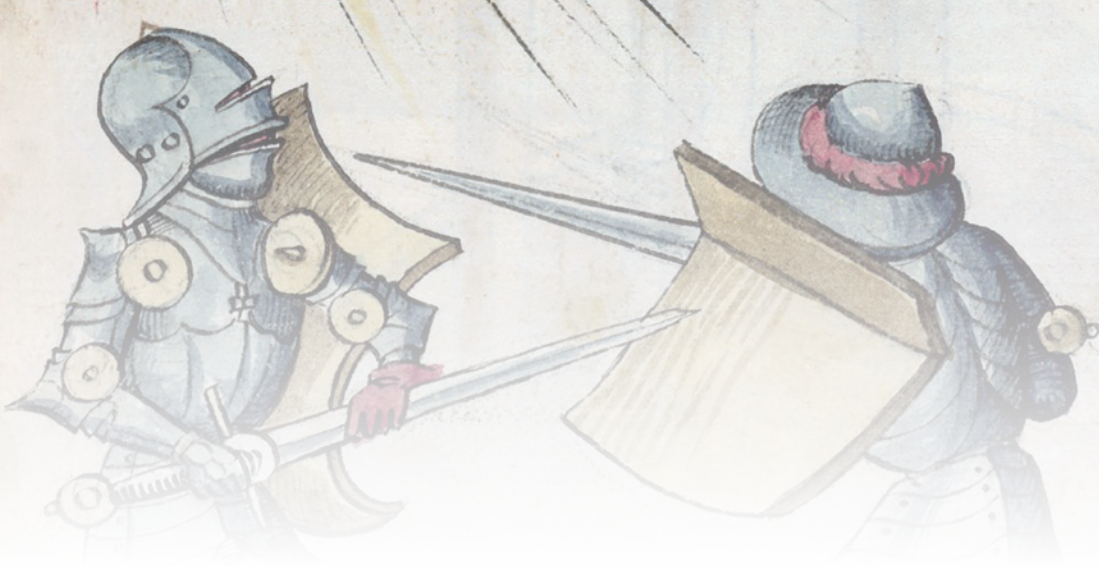


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INTRODUCTION

From King Arthur's Excalibur to the lightsabers of Star Wars, swords have always had a special status. The sword is the iconic medieval weapon – a cultural impact that appears in everything from pre-Raphaelite paintings to fantasy video games, even if spears or pollaxes were actually more common or more effective in reality. The sword's symbolic role in dubbing ceremonies to create new knights or when carried in procession before great nobles cannot obscure its ultimate purpose as a weapon intended to kill. Moreover, swords continually evolved to achieve this more effectively, competing with improved armour designed to prevent this.

This evolution ultimately led to the longsword. Other weapons might be more effective in particular roles, but the longsword's great strength was its versatility. It was light enough to use one-handed alone or with a buckler (a very small shield used as a parrying weapon), or when mounted. It could be used two-handed to deliver stronger blows or apply leverage to rotate around an opponent's parry. It was carried as a secondary weapon alongside longbow or lance. Specialized longsword styles even arose specifically for use against opponents clad in full armour.

Longswords first appeared with any frequency around 1300. A 1305 reference to '*grans espée d'Allemagne*' suggests that these 'great swords' may initially have developed in Germany, perhaps to counter the better armour which appeared at roughly the same time and in the same places. Longswords became more common alongside this improved armour, and appeared throughout the 14th and 15th centuries. Forms adapted through time, with earlier examples optimized for heavy cutting strokes, whereas later examples were more sharply tapered for thrusting against vulnerable points in plate armour. They also tended to become longer in both blade and grip, until some late examples were almost as long as two-handed swords proper. Longswords continued into the late 16th and early 17th centuries as sporting weapons, though they lost most of their practical

battlefield application with the decline of armour, and were supplanted as civilian duelling weapons by the rapier.

Understanding how weapons were used is as important as studying their physical forms. Indeed, two-handed use of the longsword allowed (and required) new styles of fighting. Historically, study of medieval swordsmanship has been rather problematic. Victorian sport fencers viewed everything in terms of evolution towards the 'perfection' of their own time. They over-valued

the thrust, frowned on 'ungentlemanly' grappling techniques which formed an important part of the fully integrated medieval fighting systems, and glossed over the ineffectiveness of rapiers against armoured opponents. This led the swordsman and author Egerton Castle to claim in 1885 that the fighting styles of the medieval period were rough and untutored, relying on brute strength and heavy swords rather than skill (Castle 2003: 5). Besides being grossly unjust to the sophisticated fighting techniques actually used, such claims fixed the idea that medieval swords were enormously heavy in the public mind. Though it was as inaccurate as images of medieval knights being winched onto shire-sized warhorses, the incorrect idea of '15lb medieval swords' proved remarkably durable.

In the 20th century, enthusiasm for Japanese martial arts led their aficionados to claim that surviving traditions of Japanese swordsmanship were far superior to their (largely incorrect) idea of medieval European techniques, and to attribute near-magical properties to the Japanese *katana*. Hollywood has done medieval combat few favours either, with fight choreography emphasizing what looks 'cool' and spectacular at the expense of realism.

The study of Historical European Martial Arts (HEMA) has really only taken off in the last few decades, as the internet has made the wealth of original treatises in libraries and collections available to researchers and allowed widely scattered enthusiasts to share and critique each other's interpretations. This book cannot teach longsword fighting, though the Bibliography (see pages 78–79) provides a starting point. Instead, it is an introduction to the longsword both as a weapon and a tactical, economic and social artefact.



Saint Fremund, a 9th-century saint and hermit and reputedly the son of King Offa of Mercia (r. 757–96), and his companions demonstrate the various ways in which longswords can be used, delivering thrusts and cuts with one or both hands, urged on by angels also wielding longswords in this illustration from a manuscript recounting the lives of Saints Edmund and Fremund and produced as a gift to King Henry VI of England (r. 1422–61), c.1434. (© British Library Board/Bridgeman Images, Harley 2278, f.86v)



DEVELOPMENT

Forging the Queen of Weapons

THE EVOLUTION OF THE SWORD

By the time of the Late Roman Empire (3rd–5th centuries AD), the classic thrusting *gladius* (short sword) had been replaced by the longer cut-and-thrust cavalry *spatha*. The latter was a straight sword the small cross-guard of which served largely to prevent the user's hand from sliding forward onto the blade, and which remained in use into the Migration period (5th–7th centuries AD). The *spatha* evolved into the 'Carolingian' or 'Viking' sword, with relatively wide, heavy blades with roughly parallel edges and short handguard. Their short grips 'locked' the user's hand onto the weapon, and the relatively light pommel shifted the balance towards the point, optimizing these weapons for slashing cuts, though their rounded points could thrust perfectly well against unarmoured targets; acutely pointed blades were needed only against armour. Such weapons were relatively expensive; Carolingian law priced a sword and scabbard at 7 gold *solidi* – roughly six months' wages for a craftsman – which restricted these weapons to the wealthy, who might also be able to afford mail shirts. Meanwhile, poorer warriors carried a spear or the single-edged *langsaex* (Old English for 'long knife'), and relied on a shield for defence.

By 1000, these weapons had evolved into the classic 'knightly' sword, with longer cross-guards to protect the hand, and disc-shaped pommels. These larger, heavier pommels were set further back behind longer grips, balancing the weapon for both cut and thrust, while points became more acute to penetrate mail better. As knights generally fought mounted, with light lances as their primary weapon, single-handed swords were good secondary weapons after the lance broke, or in tight mounted *mêlées* where lances would be too cumbersome. The armour available – long mail coats over padding, and sometimes mail leggings – offered decent

protection against cutting blows. Warriors supplemented their armour with large shields carried on their left arm, especially to fend off arrows and crossbow bolts, or to counter strong thrusts from lances or swords which could burst individual mail rings apart.

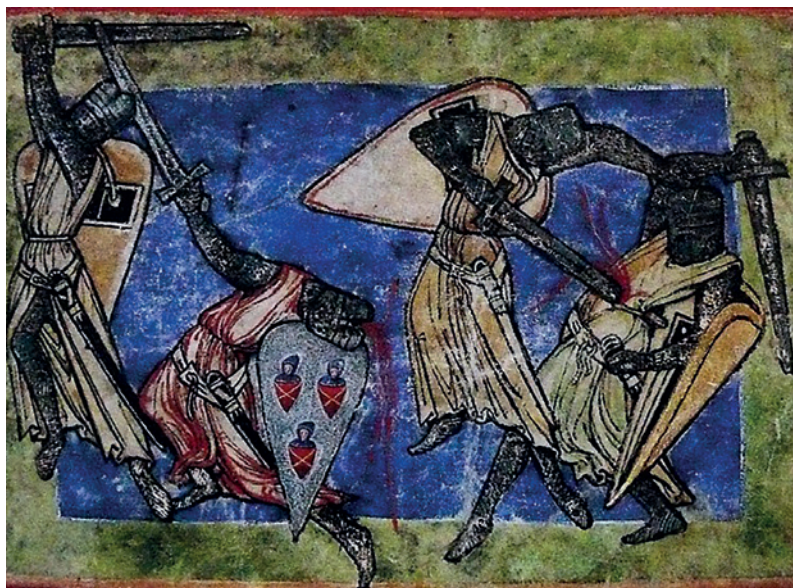
Several things happened around 1300 that changed this situation. First, tactical changes meant that while cavalry retained a shock-action role, and remained vital for scouting and pursuit, infantry became much more important on the battlefield. English writers often link this rise in importance with the longbow, but Flemish and Swiss infantry armies seemed equally capable of winning battles without that particular weapon. Second, the quality and effectiveness of armour improved, with 'coats of plates' and articulated limb defences supplementing mail, and ultimately replacing it, with entire plate 'harness' being in general use by the early 1400s. This new armour spread the force of impacts more effectively, and incorporated angled surfaces to deflect projectiles and thrusts harmlessly away. Knights had discarded shields before then, allowing them to use two-handed weapons, which could deliver extra force to defeat better-armoured opponents. Third, the improvements in metallurgy that resulted in better armour also made it both cheaper and easier to produce longer sword blades.

Some single-handed swords evolved into what are generally called 'arming swords', with sharply tapering blades. These weapons penetrated better when used to thrust and the combination of tapered blades and relatively large pommels moved the weight back towards the hand, making the 'arming sword' more manoeuvrable at the cost of reduced weight in the cut. Other single-handed swords developed in the opposite direction, becoming single-edged falchions which relied on heavy blades that swelled toward the tip for maximum cutting effectiveness, but at the cost of being too unbalanced to thrust well.

The three developments mentioned above resulted in longer swords, however, which could be used in one hand while mounted, but for which a second hand could be added when used on foot if necessary. These 'longswords' started to appear from the 1250s, became most popular from 1370–1440 (when they rivalled one-handed swords for popularity in art) and continued until after 1500, when gunpowder weaponry changed the nature of battle. The distinguishing longsword characteristic was the longer grip, rather than a longer blade, though the two often went together. Placing the second hand onto the hilt allowed more strength to be applied and also increased the leverage exerted by the rear hand, potentially making them very manoeuvrable weapons.

Medieval weapons were not made to standard patterns, and evolved through time as technology progressed. Early longswords – especially those made before 1300 – resembled large versions of contemporary single-handed swords, with relatively broad parallel-sided or slightly tapered blades, apparently still primarily intended to deliver strong cuts against mail. Later longswords (after 1350) gained blades that tapered notably throughout their length to a sharp point and had diamond-shaped blade sections, creating strong and rigid thrusting weapons optimized for use against opponents clad in plate armour. Finally, in about 1400 the

Two-handed sword-strokes delivered more power once sword grips became long enough to accommodate both hands. The knights depicted are allegorical representation of two virtues defeating two vices in 'The Victory of Humility over Pride' from the *Speculum Virginium* ('Mirror of Virgins'), a text on female monastic life from c.1200. (Kestner-Museum, Hanover Inv.-Nr. 3984/Wikimedia/Public Domain)



preference swung to 'all purpose' cut-and-thrust types, with sharp points for thrusting but which were wide and flat enough at the blade's centre of percussion to cut well.

Some writers stated that swords should be proportionate to the user, and thus defined sword lengths in terms of the user's body. Contrary to myth, however, medieval people were not significantly shorter than people of today – height declined with poor diet during the Industrial Revolution (c.1780–c.1840), and did not recover until the 1940s. The maximum length for general-purpose longswords was limited by what could be drawn from a scabbard, but later manuals depict longswords that were too long to carry easily in a belt scabbard, and which were apparently specialist duelling weapons.

Fiore dei Liberi da Premariacco, writing in about 1410, taught his single-handed and mounted techniques with the same relatively short longswords as used in his armoured fighting techniques, which prevented these weapons from being too long or heavy. Depictions in art and surviving effigies suggest swords with pommels 3–4in above the navel when the tip rested on the ground, and grips just under a handspan (approximately 9in) long. By contrast, Filippo di Vadi, another Italian fencing master, writing around 1485, stated that swords should come to the armpit when the point rested on the ground, including grips a handspan long, and those illustrated by Joachim Meyer, a German fencing master, in his 1570 longsword manual *Gründtliche Beschreibung der Kunst des Fechtens* ('Thorough Descriptions of the Art of Fencing'), seem to be of a similar length. Indeed, Vadi actually states that longer swords are more dangerous to fight against (Windsor 2018: 176). Longer swords led to changes in fighting techniques, and it is unlikely that these very big longswords were usable one-handed. Context is important, however: Fiore envisaged the same sword being used on foot and mounted, whereas Vadi and Meyer only show foot combat, and

therefore swords optimized for that particular role. The English nobleman George Silver, though, in his *Paradoxes of Defence* (1599), described longswords with the same blade length as single-handed swords, but longer hilts, entailing weapons much closer to those of Fiore.

Some suggest that short longswords were termed ‘bastard swords’ due to being neither one thing nor another, but there is little evidence for coherent use of the term. Indeed, the fact that the fencing master Joseph Swetnam, in his fencing treatise *The Schoole of the Noble and Worthy Science of Defence* (1617), had to define bastard swords (longer than short swords, but shorter than longswords) suggests that his audience would not understand the term otherwise.

Despite myths of ‘15lb medieval swords’ – originally based on large and impractical bearing swords which survived exactly because they were ceremonial items never intended for use in combat – most medieval longswords were reasonably light. Surviving examples typically weighed 2½–4lb, light enough for easy use in one hand, let alone two. Unusually heavy swords did exist – the 14th-century historian Jean Froissart describes the Scottish knight Sir Archibald Douglas delivering enormous blows with an immense sword no-one else could wield – but they were the exception. Vadi tells us to select a sword that is light rather than heavy, so that it can be controlled easily without struggle (Windsor 2018: 177).

Some manuscripts show longswords with unusual features not seen in surviving examples. The anonymous ‘Gladiatoria’ *Fechtbuch* (‘fightbook’) describes unscrewing the pommel of one’s longsword to throw at an opponent, and the German fencing master Hans Talhoffer illustrates the threaded tang for such a pommel. This would have ruined the sword’s balance as a cutting weapon, however, though it would have remained usable for two-handed thrusting in the armoured combat these authors depict. Other sources show swords with spiked cross-guards and pommels for striking opponents more effectively. Fiore illustrates a sliding semicircular bracelet attached to the midpoint of the blade to protect the leading hand during half-swording, while several French and Burgundian accounts of mid-15th-century foot combats describe longswords with similar rondel guards on their blades. Fiore and Vadi depict specialized swords for armoured combat, with spiked pommels and narrow blades that flare out into spearheads at the tip, like the special swords used for boar hunting. With practically no cutting edge, these swords are similar to the weapons described as *estocs* or *tucks*, and functioned more like short polearms than swords. They closely parallel the *Ahlspiess* (‘awl pike’), a short spear of German origin with a long head and the rondel handguard part way down the shaft.

Finally, some of the single-edged German *Messer* (‘knives’) were large enough to use two-handed. Known as *Kriegsmesser* (‘war knives’), these weapons generally had grips made from scales riveted to either side of a full-width tang, and often lacked a pommel. Blades might be straight, or curve slightly. Although *Kriegsmesser* filled a similar niche to the longsword, space precludes detailed discussion.

OPPOSITE

A selection of longswords. Starting at the bottom and working upwards: **(1)** German, 1350–1400, with an Arabic inscription commemorating deposit in the armoury at Alexandria, Egypt (IX.915); **(2)** German, 1300–99 (IX.1084); **(3)** 1371–99, with recessed insets in the pommel to take (lost) decorative insets (IX.1085); **(4)** 1400–99 (IX.2149); **(5)** mid-14th century (IX.1106); **(6)** 1400–30, supposedly found in England (IX.16); **(7)** decorated German longsword, c.1480 (IX.949); **(8)** German longsword, 1480–1520, with small side ring and finger guard (IX.38); **(9)** Venetian longsword, 1500–30 (IX.763). Grips on all but the last three swords are restorations. (© Royal Armouries)

THE ANATOMY OF THE SWORD

A sword has two main components, the blade and the hilt.

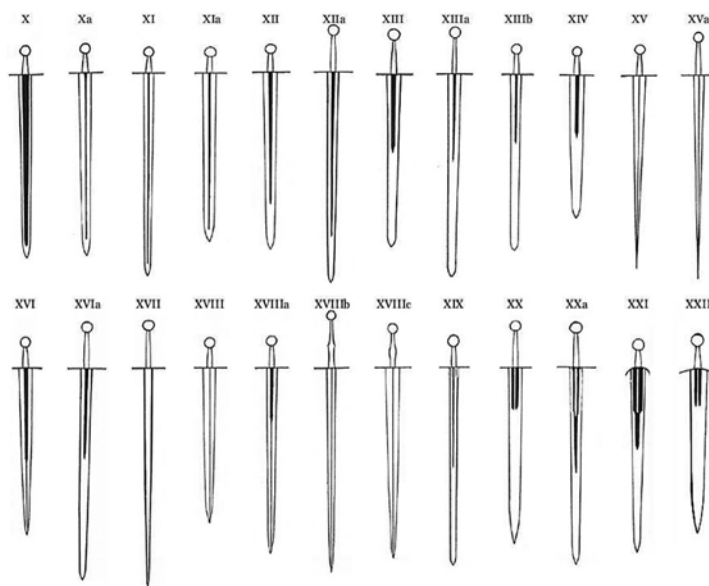
Longsword blades were usually symmetrical and sharpened on both edges. The edge closest to one's knuckles when gripping the sword was termed the primary edge, true edge or long edge, while the other was known as the back edge, false edge or short edge. Despite the names, both edges were the same length. The back edge was used in some strikes, and a notched or dulled sword could be turned over in the hand so it became the new primary edge.

Blades generally narrowed in width and in cross-section as they got further from the hilt. The degree of taper reflected the intended use: sharply tapered blades would be better for thrusting against armour, but reduced weight near the tip made them less efficient for cutting, and very slim points easily broke against armour unless reinforced.

Earlier blades tapered moderately, allowing use for both cut and thrust. A central groove or fuller often ran down the centre of these blades from the hilt, usually for half to three-quarters of their length. This groove both lightened the blade and gave it extra rigidity; structurally, it acted as an inverted arch. The fuller has been mythologized as a 'blood groove' allowing victims to bleed out after being stabbed, or allowing swords to be withdrawn more easily by 'breaking the suction'. Neither of these claims makes practical sense, however – in the first case, internal bleeding is equally effective, while in the second, what holds swords in the body is muscle contraction rather than suction.

After the mid-14th century, blades became more sharply tapered and often gained flattened-diamond or hexagonal cross-sections. They commonly had thicker blades, and though both types tapered toward the point in thickness as well as in width, this distal taper is less pronounced on later blades, increasing rigidity for thrusting. As the mid-rib of the diamond stiffened the blade, they generally lacked fullers. In the second

The standard typology for medieval swords was created by the historian and illustrator Ewart Oakeshott, based on blade form. Many of the types might be found with a variety of different pommel forms and might even have been re-hilted during their working life; they are shown here with simple round pommels. Multiple types might be in use at any given point, for different purposes and situations. (Ewart Oakeshott/Wikimedia/Public Domain)





quarter of the 15th century some diamond-section blades were so deeply hollow-ground that they almost resembled flat blades with medial ribs.

The shape of blades determined whether they would be better at cutting or thrusting, with very specialized weapons – the heavy but square-pointed executioners' sword and the edgeless thrusting *estoc* – at either extreme. Less tapered blades had more mass at the 'centre of percussion' nearer the tip; more weight further from the hands increased leverage, and allowed stronger blows for a given amount of muscular strength.

The cutting edges of blades are effectively wedges that split the target apart, and wide flat blades with a fuller meant that the wedge could be longer and thus more acutely angled than diamond-section blades, reducing friction and cutting deeper for the same effort. This absolutely does not mean that tapered diamond-section blades could not cut well, merely that they were less optimized to do so.

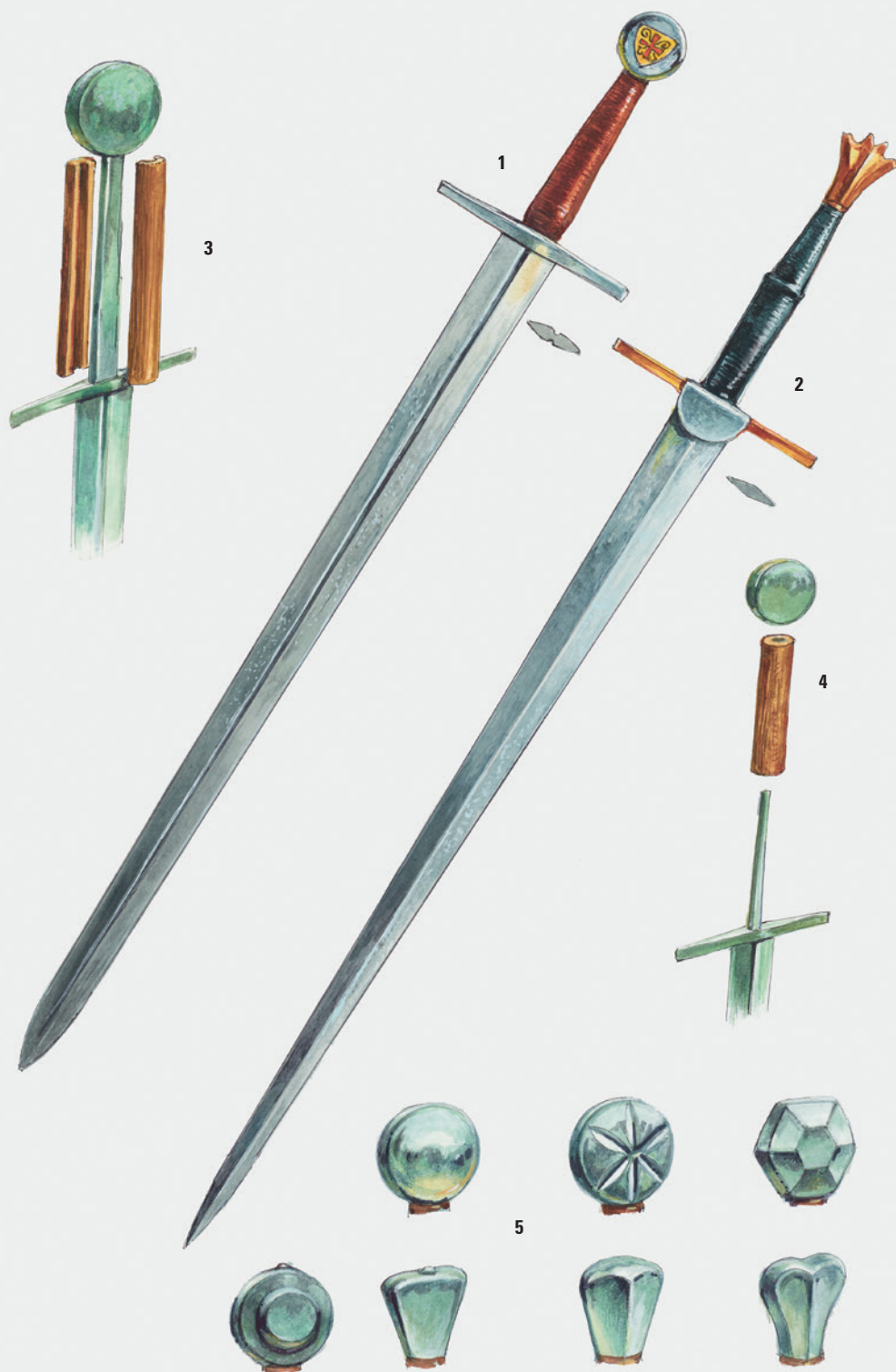
Sword points are the same wedge as the edge, but here it is the narrow tapered blades which have the longer wedge. Thrusting blades must also be stiff or they will bend rather than penetrate, again favouring the diamond cross-section. The German tradition divided the exposed section of the blade into two sections of equal length: the *Stärke* ('strong') from hilt to middle, and the *Schwäche* ('weak') from middle to tip. Meanwhile, the Italians divided it into three: the *Forte* ('strong') at the hilt, *Mezza* ('middle') and *Debole* ('weak') between middle and tip. German sources recommended parrying with the 'strong' of the blade, where the short distance from the hand helped block an opponent's strike effectively, and striking back with the 'weak', where longer leverage enhanced the speed of one's own cut. The Italian tradition preferred using the 'middle' of the blade, but both depended on circumstance and relative positioning.

A short section of blade nearest the hilt might be left unsharpened in what was later called a *ricasso*. This allowed the first finger to be slipped over the cross for better control at the price of exposing the finger.

The tang was a narrow section at the rear of the blade, opposite the point. This ran through the grip and pommel, and was hammered over the rear of the pommel to secure the weapon together. Ideally, the narrow

Two swords in detail (opposite)

Medieval swords were not made to standard patterns, so these can only be examples. The sword on the left (1) is a relatively early longsword, an Oakeshott Type XIIIa from the late 13th century. Its fullered blade has a relatively limited taper, giving it the weight at the centre of percussion to deliver a good cut. The enamel insert in the wheel pommel is not typical, but based on a real example. The sword on the right (2) is a later Oakeshott Type XVa from the early 15th century. The flattened-diamond-section blade is more notably tapered to a sharp thrusting point. The gilding on the cross-guard and 'fishtail' pommel is also based on surviving examples. Also shown are two methods of fitting the grip scales to the tang (3, 4); the grip binding is omitted for clarity. Only a selection of pommel forms is illustrated here (5).



body of the tang curved into the wider shoulders of the blade, because internal angles formed by square corners exaggerated fatigue cracking, but this was far from universal.

The hilt was made up of three components – the cross, the grip and the pommel – and might have additional parts such as rainguards or finger guards.

The cross (sometimes called the ‘quillons’, but this is a post-medieval term) was a metal bar at the base of the blade, which prevented the user’s hand sliding forward onto the blade itself, and protected the hand from an opponent’s sword sliding down the blade towards it. The cross could also be used to strike opponents; indeed, Vadi recommends sharpening the ends for exactly that purpose. 15th-century examples are sometimes bent into horizontal S-shapes, and late longswords – from the late 15th century onwards, especially in Spain and Italy – might supplement the cross with finger rings mounted in line with the blade to protect fingers used in *ricasso* grips, or by side rings perpendicular to the blade, protecting the hand. Longswords rarely acquired the complex hilts of later rapiers and broadswords; these impeded the two-handed grip that made longswords so effective, while knights’ hands might be protected by armoured gauntlets.

The grip itself usually had a wooden core. This could be made in two halves, hollowed out for the tang and glued together on either side of it. Alternatively, one-piece grips had holes drilled centrally, slightly narrower than the tang, which was heated and pushed into the grip to burn itself a perfect fit against the interior. Sword grips were ovoid, automatically aligning the blade edge in the hand to deliver a good cut. (By contrast, blunt weapons such as maces had cylindrical handles, as it did not matter which part struck the opponent.) The wooden grip core was then wrapped tightly in cord coated with glue, and finally a leather outer, applied wet for a tight fit when the leather dried and shrank. There might be a final wrapping of cord or metal wire above the leather, and the grip might have distinct ‘stepped’ or ‘waisted’ sections with different profiles. Swords designed for appearance might have grips of ivory or polished horn.

The pommel fitted at the far end of the grip, and the protruding end of the tang was often hammered over it to secure the weapon together. The pommel counterbalanced the weight of the blade, improving the weapon’s manoeuvrability. It could also be used to strike an opponent after parrying their sword with the blade. Long grips permitted the use of a second hand, and also moved the weight of the pommel further from the blade. Like sliding weights along a scale, this allowed a lighter pommel to have the same effect as a heavier one closer to the blade.

Pommels need not be hard steel, and might be cheaper iron or even latten (brass). Many earlier longsword pommels were flat wheel types, but shapes proliferated in the 15th century, including ‘fishtail’ designs and spherical pommels which worked as rear grips, allowing the hands to move further apart and increase leverage for some techniques. High-status swords might have their pommels silvered or gilded, or inlaid with

METALLURGY AND THE LONGSWORD

The ideal sword blade needed to be both hard (to resist deforming or bending) and tough (to resist brittleness or fracturing), and needed to take and retain a good edge. The optimal material to meet these requirements was a low-carbon (0.6–0.8 per cent) steel, but this was difficult to produce with early medieval technology, as shown by Viking saga accounts of swords bending in use and being straightened under a foot.

Medieval people thought steel was a 'purified' form of iron and that the heat of the furnace was burning out impurities, whereas the reverse is actually true and it is an alloy. The atoms in a piece of pure iron can slide over each other relatively easily, making it relatively ductile and easy to work. Adding a small amount of carbon creates a matrix which prevents the iron atoms moving over each other so easily, creating the much harder alloy steel. Steel can also be further hardened by quenching, whereas iron cannot. Adding too much carbon increases hardness, but also makes the metal too brittle for use in swords.

Iron ore is widely found, generally in the form of iron oxides, but unfortunately the melting point of iron is 1,538°C, effectively impossible to achieve without a blast furnace. Early medieval iron-making therefore used the bloomery method. This used clay or stone furnaces, with air pipes (tuyeres) near the bottom. The furnace was pre-heated with charcoal, wood partially burned in sealed 'charcoal clamps' with limited oxygen to drive out water and reduce it to relatively pure carbon.

The furnace was loaded with roughly equal proportions of charcoal and crushed iron ore in layers and set alight, with air being sucked in through the tuyeres via natural draught or forced in by bellows to increase the heat of the fire. The incomplete burning of the charcoal produced carbon monoxide, which combined with the oxide ores to give carbon dioxide plus metallic iron, thus allowing smelting despite not reaching the melting point of the iron. The small iron particles collected at the furnace bottom as part of an impure porous 'bloom' containing iron, silicate slag and carbon. Once the furnace cooled, these blooms were reheated in a forge and hammered to drive out the molten non-metallic slag. The process generally produced wrought iron, with negligible carbon content. This was then carburized by packing pieces of charcoal or similar organic material around rods of wrought iron and heating them, so that carbon transferred into the surface of the iron, turning it into steel. Some wrought iron tended to self-carburize during the initial bloomery process, but this was undependable.

As carbon was absorbed primarily at the surface, the outside of the rods became hard steel, but the non-carburized interiors remained softer but tougher. A number of such rods could be heated and hammered together to forge-weld them into a suitable sword blank, producing the famous 'pattern-welded'

blades of the Dark Ages (5th–10th centuries AD). This was labour intensive, however, and fell from use before 1000, when better, more homogenous steels became available. An entire sword blank could be made from iron and carburized as a unit, but though this was cheaper and simpler, it was not really suitable for blades because only a relatively thin outer layer of the steel carburized, and this quickly wore away with repeated re-sharpening. Some blades simply had steel edges forge-welded to an iron core.

By the Late Middle Ages (as early as 1200 in Scandinavia, but later elsewhere), bloomery forges became larger. Because heat produced increases with the volume of the furnace, and heat loss increases with surface area, bigger furnaces achieved higher temperatures. Larger furnaces also meant the semi-molten iron absorbed more carbon while draining through them, lowering its melting point to around 1,150°C. When combined with using water power to supply a stronger air blast, these early blast furnaces produced molten pig iron which could be separated from the molten slag floating on top of the iron.

Unfortunately, this pig iron contained 3–4 per cent carbon, making it too brittle to forge immediately, and had to be treated in a finery where an oxidizing blast drew out some of the carbon, causing the liquid pig iron to re-solidify as the loss of carbon increased the melting point. Overall, this 'indirect process' extracted iron from ore more efficiently and was more economical in fuel, reducing cost per unit significantly.

The alternative 'crucible method' involved heating wrought iron and pig iron together in a sealed container for prolonged periods until both were semi-molten, effectively 'averaging' their carbon levels. This was never perfect, however, and led to high- and low-carbon bands, which had to be homogenized by repeatedly folding and hammering the steel to create multiple layers. This was a much slower process and produced small batches of steel (perhaps only enough for a single sword), but examples are known from before 1000.

Whatever the method, a lack of measuring equipment and precise process control meant that medieval steels suffered from variable carbon content, and could not match the quality of modern steels.

decorative enamel and glass. A few even contained compartments for small holy relics or charms, making them spiritual as well as physical defences.

Finally, swords might be fitted with small circular 'rainguards' of leather or (less frequently) sheet metal, folded in half over the cross of the sword. The conventional explanation is that these covered the scabbard mouth, protecting the sword within from rain, but this has been disputed and some see them as giving limited protection to the fingers.

FORGING A SWORD

Swords were made using charcoal-fired forges, with an apprentice working leather bellows to blow extra air into the forge for increased heat. The lack of measuring equipment meant that smiths had to judge temperatures based on the colour of the hot metal, and forges were often kept dim so this could be seen more clearly. They were usually well ventilated – sometimes with open sides – to let heat and smoke escape.

Smiths rarely smelted their own iron, but began with a steel balk or blank, thicker but shorter and narrower than the finished sword, because the metal spread during the hammering process. This was heated to yellow-orange heat in the forge, then transferred to the anvil for hammering. The pieces had to be returned to the forge frequently; 'striking while the iron is hot' was not a metaphor when talking about smith work, and hammering the metal after it dropped below critical temperature risked shattering the steel. Smiths counted strikes as they hammered out the blade, and turned it over regularly so more strikes on one side did not cause the blade to curve or become asymmetric. Fullers were hammered into the metal with rounded dies, and the smith shaped the rough bevels of point and edges, doing as much as possible with the hammer because

A medieval anvil and forge complete with chimney and bellows from the Holkham Bible of c.1330, showing the smith's wife making nails to attach Christ to the cross. A real forge would obviously be larger than this stylized depiction, but female smiths and armourers do appear in the documentary record. (© British Library Board/Bridgeman Images, Add.47682, f.31)



SWORDSMITHS AND MANUFACTURERS

Like other manufactured goods during the Middle Ages, swords were produced by a guild system that passed on the 'mysteries' of each craft and assured standards of quality. The guilds also protected local craftsmen from 'unfair' competition from outsiders, cared for aged or infirm members, and even possessed real political power in some European cities. Members followed their fathers into the craft, or joined as apprentices in their early teens, signing indentures with masters who taught them the trade in return for a set period of service, usually five or seven years. Apprenticing into lucrative or prestigious trades often required paying premiums to the master, or was restricted to relatives of existing members.

Apprentices often lived in the master's home, and guild rules governed their treatment to prevent exploitation. After completing apprenticeship, craftsmen became journeymen (from *journée*, 'day' in French) who could then work for any master for a daily rate. After several years, journeymen produced 'master pieces' as proof of their skills, and became master craftsmen, able to set up their own workshop and take on their own apprentices and journeymen. Master craftsmen's wives and daughters might also practise their trade; Katherine of Bury, mother of King Edward III of England's (r. 1322–77) smith, was paid 8d per day to keep up the King's forge at the Tower of London and carry on the work of the forge while her son was absent with the King during the Crécy campaign of 1346–47, as did Margaret Merssh, who ran the forge at the Tower while her husband was away on the Agincourt campaign of 1415. The York Freeman's Register records two female armourers in the 15th century: Margareta Langshawe in 1436 and Johanna Armorer in 1488.

Most guilds restricted the size of workshops – the statutes of Nuremberg in Germany prevented masters taking on more than one apprentice and two journeymen, for example, while the English Ordinance of Founders of 1390 allowed masters only one apprentice, or two if they had no wife – thus preventing individuals dominating the trade. Guild craftsmen often had narrow specialisms and were forbidden to encroach on another guilds' work. London had 14 separate guilds involved in various forms of ironworking by 1422; armourers were not permitted to make weapons, and vice versa.

Masters were supposed to mark their work to prove items were manufactured by guild tradesmen rather than by 'strangers' with no right to work in a particular city, and so guilds could track shoddy work, but the lack of marks on surviving swords and the frequent re-issue of such rules show this was not always done. Armourers' marks on plate armour are more likely to survive and show almost every piece was made by separate specialists, then assembled, heat-treated and finished. Contracts show that

individual journeymen were employed to make helmets, gauntlets or other specific items, while polishing was another separate speciality. Rather than swords being made from start to finish by a single craftsman, it seems that completed blades were passed on to different craftsmen for polishing, hilted and decoration.

While famous armourers could become rich, smithcraft was not especially prestigious; Pietro Monte, a 15th-century master of arms, described it as a lesser art, quick to learn and low paying. Whereas armour evolved into several regional styles, the same sword forms are found across Europe. Good armour required careful fitting for optimal movement but the same sword could be used by anybody.

The trade in weapons is less documented than the trade in armour, but we have accounts of sword blades being produced in large quantities in the great metalworking centres such as Innsbruck in Austria, Milan and Brescia in Lombardy, Passau, Cologne and Augsburg in Germany and Bordeaux in France. These were generally located near high-quality iron-ore sources, though the concentration of expertise helped maintain their dominance. High volumes allowed these centres to invest in new technologies, such as water-powered trip hammers and polishing wheels, while in the Lombard towns large armourers effectively freed themselves from guild constraints and produced munition-quality armour and weapons by something approaching mass production. From these centres, semi-finished sword blades were packed in barrels for shipping, to be polished, hilted and finished locally to the purchaser's specification.



A sword being ground on a large hand-cranked grinding wheel in a manuscript, c.1250. Such wheels would be used to apply the main bevels before switching to finer whetstones for sharpening. Water-powered grinding wheels appeared later, but required significant investment. (Hulton Archive/Getty Images)



Various weapons existed to fill the same niche as the classic longsword, but without following its classic form. From left to right: a South German single-edged *Grosse Messer* ('large knife'), c.1480–1520, with a pommel-less grip made from two scales riveted to the gilt and a small shell guard on the cross (IX.5608); a curved single-edge sabre from Flanders, c.1500, with engraved decoration on the blade just above the cross (IX.634); a boar sword, c.1530–70, with crosspiece to prevent over-penetration (IX.5391); and a blunt-tipped executioner's sword, 1600–40 (IX.35), with the inscription ME FECIT SOLINGEN ('Solingen Made Me') inscribed in the shallow fuller. The resemblance between the boar sword and the special swords for fighting in armour shown by Vadi is obvious. (© Royal Armouries)

grinding blades afterwards was labour intensive in the absence of modern belt grinders.

Unlike iron, steel can be hardened by quenching, in which very rapid cooling leads to the formation of very small-grained crystals, which increase rigidity as they do not easily slide over each other. Once primary shaping was complete, the sword was heated, then plunged into water to quench it. This significantly increased hardness at the price of making it rather brittle. Tempering the sword after quenching by reheating to a lower temperature annealed the stresses within it, removing some of the hardness but the majority of the brittleness, giving a hard, tough blade. Quenching was done point first to avoid blades distorting as one side cooled first. There is no evidence for differential quenching as done

with Japanese *katana*, where the blunt back edge was covered in clay to shield it during quenching, so only the cutting edge was hardened.

'Slack Quenching', where the sword was cooled less drastically – either by letting it cool a little before quenching, or using quenching media such as linseed or olive oil, boiling water or even molten lead which did not draw out heat as fast – produced blades which were less hard, but also less brittle, and did not need a tempering process. Apart from saving time, it removed the risks of distortion and 'over-tempering' the steel by removing too much hardness. Alternatively, the blade could be quenched immediately but removed from the quench tank after only short immersion; heat then travelled out from the still-hot core of the weapon, and it would 'self temper' itself. Some authorities suggested quenching in wine or urine, or suggested plant or mineral additives to improve the quenching liquid. While some additives were based on superstition, others might actually improve results by reducing the steam envelope that formed around the red-hot blade when it was put into the quenching medium.

The blade was cleaned to remove forge scale and given a final shaping by grinding, either by hand or on a wheel, before the grip and pommel were added, very possibly by a craftsman in another town after the semi-finished blade was sold onward. Cross-guards were formed from iron bars with slots driven through the centre with a punch. This slot slid over the tang and the cross was hammered lightly down while hot, giving a tight fit once the metal cooled and shrank. Finally, the sword was polished with abrasives before sharpening with a series of steadily finer whetstones.



USE

Hot blood and cold steel

MEDIEVAL FIGHTING BOOKS

Numerous medieval fightbooks (*Fechtbücher* in German, singular *Fechtbuch*) are known. The earliest surviving example is an anonymous early-14th-century Latin I.33 manuscript, teaching sword-and-buckler fighting. These books were part of a widespread tradition of instructional manuscripts covering falconry, household management, courtesy and other skills, but are not ‘instruction manuals’ in the modern sense. They assume some previous knowledge of sword fighting, so there is little mention of footwork despite its importance. Nor are techniques always explained clearly for the novice – as differing modern interpretations of the same fightbooks show – and they are better regarded as ‘memory



Created in Germany in the early 14th century, the anonymous Latin I.33 manuscript is the earliest surviving fight manual, teaching sword-and-buckler fighting. Interestingly, the fighters illustrated include a priest and a woman, the latter labelled as ‘Walpurgis’.
(© Royal Armouries I.33)

aids' to help readers practise advanced techniques they had already been shown.

Literacy was reasonably common among the middle and upper classes by the 15th century, especially because most fightbooks were written in vernacular languages (primarily German and Italian) rather than Latin. Although the first printing-presses appeared in the 1440s, only the last fightbooks covering the longsword were printed, on relatively cheap paper. Most were hand-written by professional scribes on parchment, which limited the number of copies produced, and meant they were relatively expensive. This was especially true for those illustrated by professional artists. As with elaborately illuminated medieval liturgical books, such high production values did not prevent them being functional, but reminds us that they served social as well as purely practical roles.

For rich patrons, possession of high-quality fightbooks symbolized wealth and status, emphasizing the owner's interest in prestigious knightly activities. For fighting masters, lack of copyright meant most profit in producing books went to the scribe rather than the author. Dedicating or presenting elaborate copies to wealthy patrons was, however, an acknowledged way to gain return gifts or positions in the recipient's service.

How representative are the fightbooks?

Joachim Meyer emphasized that fencing must be learned through practice, not just from books. Fiore said that one needed books to be a good teacher or a good student, as the art was so vast that one could keep only one-quarter of it in the memory, but that only one of his students owned a fighting book. Each hand-copied fightbook might be read by only a few people. On the other hand, medieval books often had long working lives and might equally be used by a whole series of owners and their students.

Few men were regarded as 'masters': several fightbooks are scathing of poor-quality teachers, and of *Büffel* ('buffaloes'), unskilled swordsmen relying upon strength and aggression. Did the techniques depicted in the fightbooks really represent those used by the average man? Johannes Liechtenauer – the most famous German master – says that he purposely wrote using secret and hidden words so that not everyone would understand it, and to prevent frivolous fighting masters sharing it with unworthy people (Tobler 2010: 95). Every master had an obvious vested interest in presenting himself as the best available teacher, however, because nobody wanted to learn from the second-best master.

Fiore explicitly says that he taught students privately, so his techniques would not become widely known. This was understandable when training students for judicial duels, as knowing how they trained might help opponents. His clear structure of masters and counter-masters shows that he taught counters to his own techniques, however. Unless he was training students to fight each other, or teaching counters to moves they would never meet, then at least some techniques shown by his initial masters must have been in general use.



These fighters from Hans Talhoffer's 1459 manuscript have very different weapons, despite apparently being in a formal fighting ring. The spearman had the advantage of longer reach, but was in real trouble if the swordsman managed to deflect the first thrust and step inside the spear's range. (Hans Talhoffer/Wikimedia/Public Domain)

Where fightbooks were intended to solicit patronage, they may have acted as much as résumés as textbooks and were thus likely to emphasize clever and exceptional techniques, rather than the commonplace. Some techniques might thus be less common than the sources suggest, however, just as modern aircraft pilots spend much time practising drills for emergencies which rarely occur.

The fightbooks are valuable resources for understanding medieval sword fighting, but cannot be used uncritically. Even those with illustrations show one step in a series of actions, forcing us to reconstruct the rest. The pictures themselves can be misleading. Perspective drawing was not fully developed and they are better understood as diagrams rather than photo-realistic depictions. Figures may be moved apart to show moves clearly, or closer to avoid wasting space. Arms can be disproportionately long to demonstrate locks, while swords grow or shrink to suit the move shown. Pairs of unrelated figures are sometimes placed opposite each other, simply to make best use of the page.

When talking of regional 'traditions' of longsword techniques, we should remember these areas were well connected in the medieval period. Fiore learned from German and Italian masters, and London masters complained of foreign teachers in their city. Such traditions are thus unlikely to be completely independent. Indeed, it is better to think of the traditions as lineages of masters taking different approaches – while the Liechtenauer lineage is the best known German tradition, it was not the only one.

Space precludes detailed discussion of individual masters and texts, and the comments here must inevitably be generalizations. There was considerable variation over the century or more of practice covered by each tradition, as they evolved through time and each master emphasized the aspects that best suited his personal circumstances. Much of this is lost to us now, as we can only reconstruct the traditions tentatively from written sources.

The German tradition

German *Fechtbücher* are the most prolific, with masters recognized as authorities on particular specialisms. For example, grappling and wrestling generally followed the methods of Jude Ott ('Ott the Jew'), the 15th-century wrestling master to the Dukes of Austria. The acknowledged master of the German longsword tradition was Johannes Liechtenauer. We have no direct works by him, and are told he did not invent his art himself, but learned it by studying and travelling widely, perhaps systematizing existing older oral traditions.

The first record of Liechtenauer's teaching is the Nuremberg *Hausbuch* (MS 3227a), sometimes called the 'Döbringer' text. This is a 'commonplace book' containing a variety of material, including alchemical and medicinal recipes, magical formulae, methods for hardening iron and a treatise on fireworks, as well as material on grappling, sword and dagger fighting. It is usually dated to 1389 from a calendar within, but the book contains material from multiple sources and elements may be decades earlier or later. As the lack of a conventional blessing on Liechtenauer's name suggests he was alive when the book was produced, this has obvious implications for dating the German tradition.

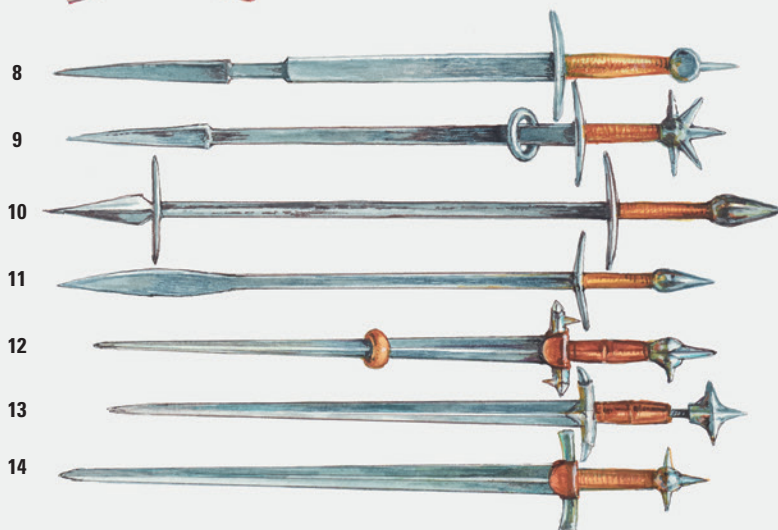
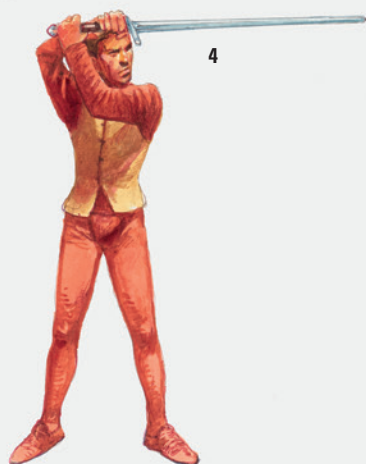
Liechtenauer's material takes the form of a poem, the *Zettel* (literally 'note') or *Merkverse* ('memory verse'), reflecting its role as a memorization aid in a primarily oral culture. It is intentionally cryptic, however, to prevent the uninitiated from learning the techniques presented. The Nuremberg *Hausbuch* is not illustrated, and it is unlikely we could reconstruct Liechtenauer's system without later material. Fortunately, later writers added interpretative 'glosses' to the *Zettel* when reproducing it. This 'original plus explanatory gloss' was a common way to explain authoritative older material such as biblical texts in the Middle Ages.

The first major surviving 'glossed' version of Liechtenauer's material

Guards of the German tradition (opposite)

The four primary guards of the German tradition were *Alber* ('Fool'; **1**), *Pflug* ('Plough'; **2**), *Ochs* ('Ox'; **3, 4**), and *Vom Tag* ('from the Roof'; **5**). All except *Ochs* could be performed as reversed left and right versions, and *Vom Tag* had a variant with both hands above the head. Later sources added further positions, notably *Nebenhut* ('Tail Guard'; **6**) and *Schrankhut* ('Barrier Guard'; **7**). Ideally, one began in a guard, struck the foe and ended in another guard, still able to defend oneself.

Several fightbooks depict unusual weapons. Fiore shows a sword with a sharp edge except for a section forming a grip for the hand (**8**); another with a blunt blade apart from the flared 6in section nearest the tip, and fitted with a sliding protective guard (**9**); and something that is described as both a pollaxe and a sword (**10**), the last being a large weapon, roughly the height of the man wielding it. Vadi's sword for combat in armour (**11**) has a flared spearpoint tip, and both pommel and cross are sharpened. Talhoffer shows two swords with rondels to protect the hand in half-swording (**12**), and a sword with a spiked pommel apparently on a screw thread (**13**). Presumably this could be unscrewed and thrown, as described in the 'Gladiatoria' *Fechtbuch*. The spiked pommels shown in Codex Wallerstein (**14**) seem almost tame by comparison.



Unarmoured longsword fighting depicted in Hans Talhoffer's 1467 manuscript, created for Graf Eberhardt von Württemberg. Note how the blades flare to form wider *Schildt* ('shield') shapes near the hilts, and the thumb placed on the flat of the blade. (Hans Talhoffer/Wikimedia/Public Domain)



is found in another compilation manuscript of 1452, usually if incorrectly attributed to 'Peter von Danzig' but including sections from several masters. The other main gloss strand appears in a text attributed to 'Sigmund ain Ringeck', although again the most common text (MS Dresden C 487) is actually by several masters. It dates from 1504–19 but preserves earlier material from the 1440s. Similar material appears in several other manuscripts, with differences due to manual copying and independent revision of the basic material.

Hans Talhoffer produced fightbooks in 1446, 1459 and 1467, covering spear, pollaxe, flail and spiked duelling shields as well as long and short swords, dagger and grappling. His books also depict an armoured judicial duel in detail, and an odd (and possibly imaginary) judicial combat between a club-armed man in a hole and a woman with a rock wrapped in a cloth sling. His lavishly illustrated books were widely reproduced in modern times but the captions are brief and uninformative. His books probably served as visual aids rather than being used in isolation, and it is difficult to know their relationship with other documents in the tradition.

The anonymous 'Gladiatoria' *Fechtbücher* group – taking their name from the best-known member of the group – were produced between 1430 and 1450, all focusing on armoured combat and illustrated in a similar style. Their relationship to the Liechtenauer sources is unclear; some plays match Liechtenauer sources closely, while others have no German equivalents. They may represent a parallel evolution in an independent tradition, or simply include extra 'advanced' moves in a particular area of specialization.

Perhaps the most lavish fencing manual was produced by Paulus Hector Mair, a wealthy patrician and treasurer of the city of Augsburg. He became an avid collector of fencing treatises, and feared that the old character-building fighting arts were being forgotten. He commissioned a huge two-volume compendium – the *Opus Amplissimum de Arte Athletica* ('Ultimate Book of the Art of Athletics') – in the 1540s, hiring two

professional fencers to pose for the well-known artist who illustrated it. The project took four years to complete, with increasingly elaborate versions produced in German and Latin. Combined with his extravagant lifestyle it consumed both his family fortune and large sums embezzled from the city coffers, before he was finally caught and executed in 1579.

The last major German longsword manual, *Thorough Description of the Art of Fencing*, was produced by Joachim Meyer in 1570, as a printed book with woodcut illustrations. His book covers the then-new rapier fencing alongside the traditional weapons. Though his teachings are generally intended for serious self-defence, the longsword was largely obsolete by this time and Meyer regarded it primarily as a teaching tool. He covers fighting in armour only very briefly, and restricted thrusts and pommel strikes as too dangerous.

The Italian tradition

The earliest surviving Italian treatise is 'The Flower of Battle' (*Flos Duellatorum* or *Fior di Battaglia* in the Latin and Italian versions, respectively) by Fiore dei Liberi da Premariacco. Fiore is thought to have been a member of the minor nobility from northern Italy. He tells us he trained numerous pupils for chivalric duels, and fought five duels himself against other masters jealous of his refusal to share his teaching. Four versions of his book survive. Three copies with numerous inked sketches apparently date from 1400–10, while the fourth has fully painted



The *Segno* ('sign') from the Getty/MS Ludwig XV 13 manuscript of Fiore's work. It depicts the master surrounded by seven swords depicting the lines of the major cuts; the sword pointing upwards towards his groin represents a thrust. He is surrounded by four animals embodying the cardinal virtues of a fighter. Clockwise from the top, they are: a lynx holding a mason's dividers (prudence); a lion with his paw on a heart (courage); an elephant bearing a tower (strength); and a tiger holding an arrow (quickness). (Sepia Times/Universal Images Group via Getty Images)

illustrations and may be somewhat later. Two are dedicated to Niccolò III, Marquis d'Este. One is incomplete, and all differ somewhat in organization. They cover grappling, baton, dagger, swords in both one and two hands and in armour, *azza* ('pollaxe') in armour, spear, staff and mounted combat. He even shows an odd pollaxe, its head filled with caustic powder to blind opponents.

Fiore structured his teachings using a series of crowned 'masters'. Each section begins with the crowned 'Master Battle' demonstrating a guard, followed by one or more 'Remedy Masters' who shows how to counter the moves flowing from that guard. Each master is followed by his students, wearing garters, who demonstrate variations and follow-ups to the move shown by their respective master. The *Contrario* ('Counter Master') wearing both crown and garter then shows how to counter the plays of Master Remedy and his scholars, and is sometimes followed by his own students. Occasionally a fourth *Contra-Contrario* ('Counter-counter Master') appears, demonstrating how to defeat the Counter Master's move. The system varies slightly between the extant versions, with figures crowned in one manuscript but wearing only a scholar's garter in another. Fiore puts less emphasis on binding and winding from crossed blades than the German tradition, while his guard positions (*posta* or *guardia*) are obviously differently named.

Although we know of a lost treatise written in about 1434 by Filippo di Bartolomeo Dardi, who ran a fencing school in Bologna, the next surviving work was Philippo di Vadi's *De Arte Gladiatoria Dimicandi* ('On the Art of Swordsmanship'), dedicated to the Duke of Urbino between 1482 and 1487. The second half of Vadi's text derives from



One of the crowned masters from the Getty manuscript of Fiore, teaching use of the sword in one hand. (Sepia Times/Universal Images Group via Getty Images)



A page from Filippo di Vadi's *De Arte Gladiatoria Dimicandi* ('On the Art of Swordsmanship'), dating from the 1480s. As with the other fighting books, grappling was an integral part of the techniques. (Filippo di Vadi/Wikimedia/Public Domain)

Fiore's material and some of his illustrations copy Fiore's almost directly, though Vadi adds a lengthy introduction including new material. A preference among the later masters of the Bolognese school for single sword and buckler, and the early and wholehearted adoption of the rapier in Italy, meant few of the later Italian treatises covered the longsword in detail, though several covered the two-handed *montante* or *spadone*.

The English tradition

The English tradition is the most difficult to reconstruct, as we have so few manuscripts. Two come from the mid-15th century, and resemble student's notes, bound together with an instructional poem ('The play with the 2 handsword in verse', also known as 'The Man Who Wol') and various unrelated material. The early-16th-century 'Ledall' manuscript is longer,

but still reasonably brief. The texts refer to ‘the toohand Sword’ and ‘Strokes of the ii hand swerd’, but inclusion of apparent single-handed moves suggests the English material also used the longsword as its primary weapon. The terminology of ‘Roebucks’, ‘Full Quarter Strokes’ and ‘Dobyl Rowndes’ is both unique and unclear, and none of the manuscripts have illustrations to help understand their meaning. The English sources do not cover fighting mounted or in armour, and do not discuss half-sword work or guard positions, though this may be a function of limited preservation. Interestingly, the manuscripts seem to include solo training sequences, combinations of attacks and footwork practised as set drills without an opponent to build a mental catalogue of techniques and fix them in muscle memory, like Asian martial arts *katas* (choreographed movements).

Finally, George Silver’s *Paradoxes of Defence* was printed in 1599, while his later (1605) *Bref instructions on my Paradoxes of Defence* was unpublished until 1898. Silver is famous for his strong disapproval of the then-new Italian rapier, which he regarded as useless except for formal duels and a poor choice even then, due to risk of mutual kills. As a result, he was sometimes mocked by Victorian fencing historians, rather unjustly given that many of his points are perfectly valid. He is best regarded as the last medieval master, explicitly trying to preserve a fading tradition. Silver calls the largest sword he teaches a ‘greatsword’, but his description suggests a longsword rather than a pure two-handed weapon. Silver’s teaching focused primarily on the single-handed sword rather than longsword, though he notes that techniques for other weapons such as the staff can be applied to it.

There seems to be a definite English preference to ‘strike and fly out’, disengaging quickly after attacks rather than the binding or winding from crossed swords common in the Liechtenauer tradition, and the grappling and dagger fighting that figures so prominently in the Italian tradition is barely discussed.

Other traditions

Given the commonality of knightly culture and military equipment, it is surprising that we lack equivalent treatises from elsewhere in Western Europe, especially because the two regions where the lack is most obvious – France and Spain – produced numerous later fencing manuals.

From Burgundy, we have only *Le Jeu de la Hache* (‘The Play of the Axe’), written in French c.1400 for Duke Philip II ‘The Bold’ and describing combat with pollaxes. The only other comparable French source is *Traicte de la Forme de Devis d’un Tournoi* (known as the ‘Tournament Book’), dating from about 1460: it describes how to organize a tournament which King René I of Naples (r. 1435–42) envisaged as a *mêlée* fought between two sides rather than as individual jousts. Although it describes the blunted practice weapons used, it contains no actual fighting instruction.

We also have the *Livro da ensinança de bem cavalgar toda sela* (‘Book of Teachings on Riding Well in Every Saddle’) by King Duarte I of Portugal (r. 1433–38), left unfinished at his death in 1438. This covers horsemanship

and mounted fighting with sword, javelin and lance, alongside advice on morality and good government. Finally, Pietro Monte's *Exercitiorum Atque Artis Militaris Collectanea* ('Collection of Military Arts and Exercises', known as *Collectanea* for short) was printed in 1509 but apparently written in the 1490s by a Spaniard living in Italy. It gives extensive descriptions of weapons, armour and the principles of their use in battle, alongside other material including physical training and techniques to appraise both horses and men.

Even so, an absence of written treatises does not necessarily mean an absence of interest in fighting skills, or that they were not practised. For example, longbow archery was central to English warfare since at least the 1330s, but the first treatise about it was Roger Ascham's *Toxophilus* ('Lover of the Bow') of 1545, published when archery was largely obsolete. Given the focus on single combat in the surviving fightbooks, the larger number of books from Germany and Italy may reflect greater interest in knightly duelling in those countries, but this is no more than a possibility.

FIGHTING WITH THE LONGSWORD

Medieval fightbooks cover a variety of weapons, but regard the longsword as most important due to its versatility. Longsword techniques are not taught in isolation, however, but alongside grapples and disarms to create an integrated system. Students are also taught how to use different weapons against each other, such as longsword versus dagger or spear. Principles learned for one weapon could be applied to others; Fiore explicitly notes that some sword techniques can be used for the pollaxe, for example, while students could apply techniques shown for the machete-like single-handed *Messer* shown in some German sources when using longswords one-handed.

Some fightbooks claim to train men for war, and include things such as men on foot with polearms being attacked by horsemen, and a mounted crossbowman being attacked by a lancer, which belong only on the battlefield. The Nuremberg *Hausbuch* notes the best guards against multiple opponents and that there is no shame in retreating when outnumbered, while Vadi (Windsor 2018: 180) says one should prefer cuts to thrusts against multiple opponents, presumably to avoid your weapon becoming stuck in one opponent and leaving you defenceless. Their main focus is one-on-one combat, however, rather than less structured fights with multiple combatants.

The German *Fechtbücher* advocated an aggressive fighting style, telling fighters to seize the initiative and that the best way to survive is by disposing of opponents as quickly and efficiently as possible. This involved more than simply speed – a good fighter should not only strike first, he



Wearing Hungarian dress, the Holy Roman Emperor Maximilian I (r. 1508–19) stands with his hand on his longsword in a woodcut from *Der Weisskunig* ('The White King'), created as a chivalric propaganda piece in 1505–16. (Hans Burgkmair/Wikimedia/Public Domain)

should strike second and third as well, keeping himself safe by putting an opponent on the defensive under a rain of blows to prevent him getting in any return strikes.

The systems use a series of guards or wards (*Leger* in German, *posta* in Italian). Pietro Monte tells us, however, that no defensive stance or ward can guarantee the user's safety, for a swordsman who focuses only on defence makes his own defeat a certainty (Forgeng 2018: 131). When one must defend, parries should ideally deflect the opponent's blade and continue straight into an attack against the opponent.

Fightbooks show a 'no holds barred' style, advocating thrusts at the face and groin, breaking opponents' fingers so they cannot hold a sword, eye-gouging and arm-breaking moves. This is ameliorated later, with Meyer teaching a restricted sporting version as well as techniques for lethal combat, but the overall impression is of brutal effectiveness. Every part of the sword was used to attack – the Nuremberg *Hausbuch* says that no part of the sword was invented in vain. The point is used for thrusts, both edges for cuts and slices; the heavy pommel is used to strike and even cross-guards are used to hook an opponent or punch like brass knuckles.

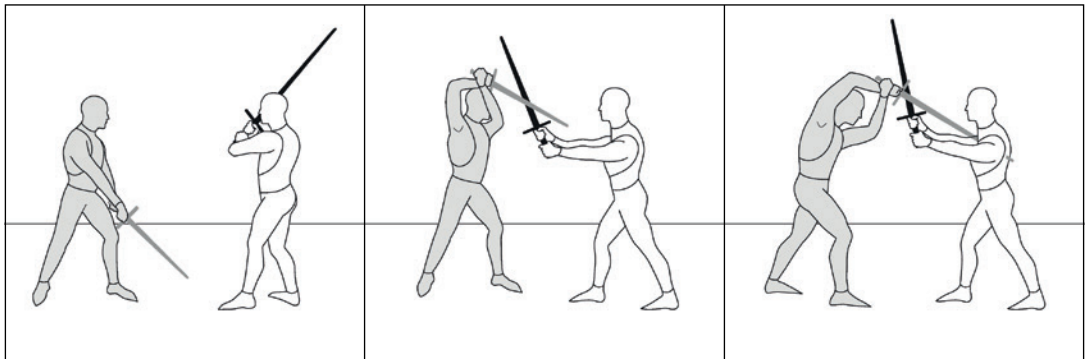
Most fightbooks teach several distinct sets of techniques, each adapted for particular circumstances: fighting unarmoured, fighting in armour and fighting mounted.

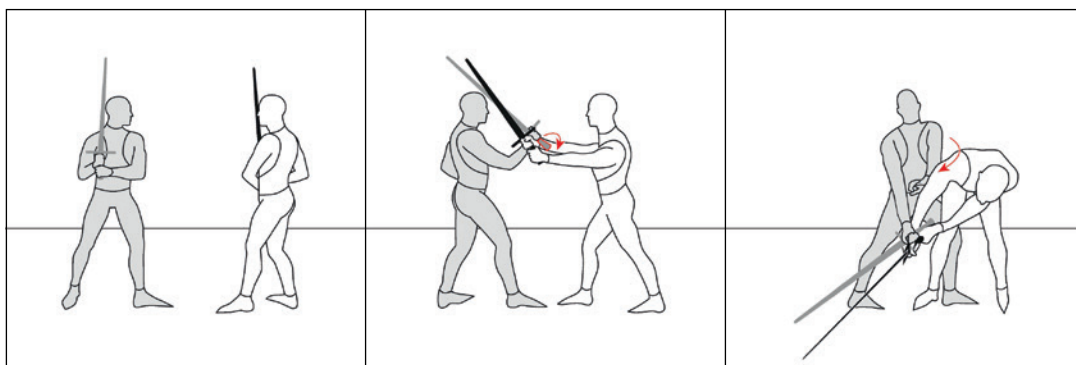
The dark figure starts in the *Alber* ('Fool') guard, and is attacked by the light figure with a cut down at his head. Dark strikes upward, deflecting the cut and ending in the *Ochs* ('Ox') guard; note that this guard must be above his head, and that he has turned the blade edge upwards as he strikes upwards. From *Ochs*, dark immediately steps forward and thrusts his point into light's heart, taking care to keep light's blade engaged with his own. Dark would probably step offline as well as forward. (Author's Collection)

Unarmoured combat

Unarmoured combat – *Blössfechten* ('bare fighting' in the German *Fechtbücher*) – was the foundation of longsword techniques, covered in almost all sources except specialized examples such as the 'Gladiatoria' *Fechtbuch*. This makes sense, as many could not afford the expensive full armour required by the harness-fighting techniques. Lightly armed troops such as archers or crossbowmen would use 'unarmoured' techniques even if they wore some protective gear such as the padded jackets Fiore describes. It was also the longest-lived of the techniques, continuing as a 'martial sport' well into the 16th century, after longswords disappeared from the battlefield.

Unsurprisingly, unarmoured fighting was also the most dangerous. Fiore said he would rather fight three times in armour in the lists than one





time in an unarmoured duel with sharp swords. This may, however, have been partly because an unarmoured duel was more likely to be fought with lethal intent. Even practice could be dangerous: The social and cultural historian Ann Tlusty records an inquest into the accidental death of a journeyman printer during a 1595 longsword match in Augsburg (Tlusty 2011: 168–71).

The techniques shown mostly have the right hand on the hilt closest to the cross and the left either below it on the grip or holding the pommel, though some single-handed moves are also shown. The four primary guards of the German tradition were *Ochs* ('Ox'), *Pflug* ('Plough'), *Alber* ('Fool') and *Vom Tag* ('from the Roof'), though later sources add additional positions. The guards of the Italian tradition have similarities, but are not identical, and are obviously differently named.

From these positions, a variety of attacks could be launched. The most important were the five 'master cuts', though the term itself is not

Grappling was taught as an integrated part of longsword fighting. Dark starts in *Vom Tag* ('from the Roof') guard, and is attacked by light. Dark releases the hilt with his left hand as he parries, stepping in as he does so. Dark then rolls the long hilt of his sword over light's wrist, and pushes up and sideways against light's elbow with his free left hand. This puts light into an arm lock, from which dark could either force him to his knees, or disengage his sword for a head strike before light can recover. (Author's Collection)



Longswords being used both one- and two-handed in an Old Testament battle scene from a German bible, c.1477. As is common in medieval biblical manuscripts, the Israelites are depicted in contemporary equipment, while their enemies are shown with exotic fantasy clothing and weapons. (Heidelberg University Library, Cod. Pal. germ. 16, fol. 23r)

Medieval harness (armour) offered excellent protection, but had vulnerable points at the face, armpits and inner thighs, and special half-sword techniques were taught to target these areas or to wrestle armoured opponents to the ground where they could be killed more easily using the rondel daggers both men wear at their hips. The illustration comes from a manuscript, created c.1542 but based on late-15th-century works by the German fencing master Paulus Kal. (Forschungsbibliothek Gotha der Universität Erfurt, Chart. B 1021, fol. 21v.)



medieval. Such powerful cuts could be immediately incapacitating against head or limb, putting opponents out of the fight. If such cuts were parried, the attacker could employ the ‘windings’ which form a major part of the unarmoured techniques. Effectively, once the attacker’s blade was parried, he used the strong of his blade against the weak of the defender’s, taking control of the bind and using the point at which the swords crossed as a fulcrum for a new attack, often a thrust. Thrusts were regarded as very dangerous to the recipient, and many moves ended with a killing thrust. Thrusts did not automatically set up the next strike as cuts did, however, and though thrusts to the torso might deliver mortal wounds, these were less likely to be instantly incapacitating than severe cuts to limbs.

This potentially left the attacker within striking range, unable to parry because his sword was embedded in his victim, and thus an easy target for a devastating counter-cut. Any thrust therefore had to be delivered without leaving the attacker easy meat for a counter-attack. Ideally, this was done by delivering a thrust that stayed in contact with the opponent’s blade, keeping it away from any line where it could harm the attacker. Failing that, one could opt for a quick disengagement, or close with the victim to ‘choke’ the aforementioned counter-attack before it could be delivered by immobilizing his sword.

The extended single-handed lunge so characteristic of later classical fencing does not seem to have been used, as it left the attacker off-balance and vulnerable as he recovered. While this was a minor problem in fights with pure thrusting weapons such as foils or smallswords, it would likely be fatal in a fight with longswords, given the powerful cuts they could deliver.

The techniques shown also include pommel strikes, disarms and grappling moves. The ‘sport’ version of longsword fighting taught by Meyer prohibited thrusts and pommel strikes for obvious safety reasons, though fighters still ‘scored’ by inflicting bloody cuts on opponents’ scalps. His repertoire was not limited to these sporting moves, however, and even those would serve as a basis for teaching serious combat.

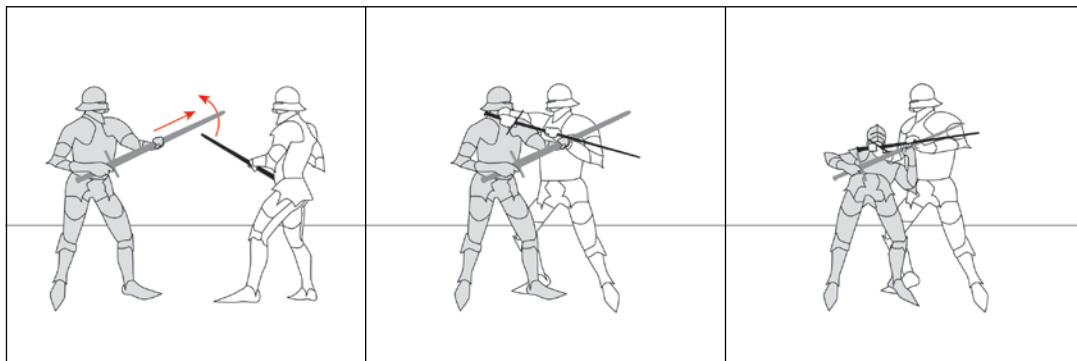
Fighting in armour

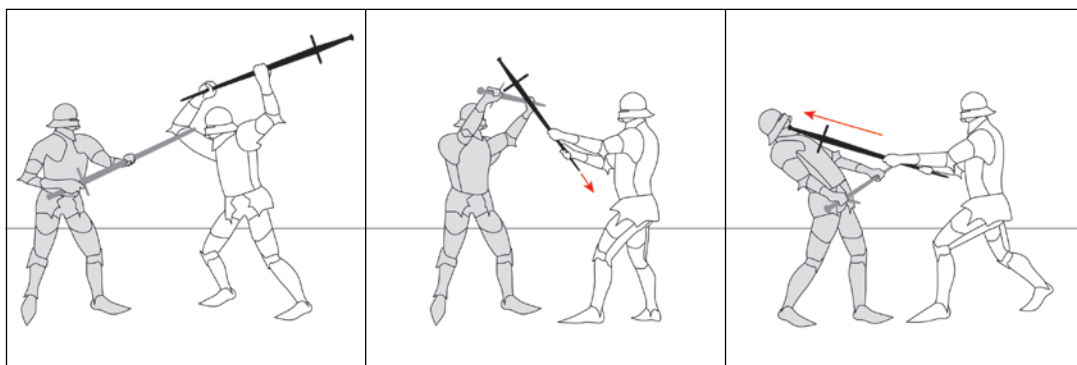
Fighting on foot in armour ('harness', in medieval terminology; the phrase 'dying in harness' originally had nothing to do with horses) was a vital skill for medieval knights, whether on the battlefield or at tournaments. Not everyone in full plate was necessarily a 'knight', however; by the 1350s non-nobles could serve as fully armoured men-at-arms if they could afford the equipment. The improvements in armour by the mid-14th century, with mail increasingly supplemented by 'coats of plates' over the torso and plate limb defences, helped drive development of the longsword, because better-protected knights no longer needed shields, but did require weapons able to inflict more damage on equally well-protected opponents. This could obviously be achieved by using two-handed weapons such as halberds or pollaxes, but these required both hands under all circumstances, and could not be carried sheathed or used mounted, and the longsword partly filled this gap.

Continued improvements in armour saw use of more and larger plates, until even powerful cuts from longswords were no longer effective and specialized techniques developed to attack the gaps in armour. Full plate harness weighs 40–60lb, lighter than the loads carried by modern infantrymen. A fit man in well-fitted armour is entirely capable of mounting a horse or getting up if knocked down, Victorian myths based on specialized jousting armour notwithstanding. The author can attest that weight is less problematic than heat build-up during prolonged exertion, and the difficulty of sucking in enough air through a closed visor. While field helmets restricted vision less than specialized jousting styles, they still limited the field of view, and wearers needed to scan left and right by moving their heads to remain aware of approaching threats. Some men opted to fight with visors open for better vision and easier breathing at the cost of leaving their faces unprotected. Counter-intuitively, in most friendly deeds of arms the combatants fought with visors closed for maximum protection, while in lethal combats many fought with visors open for better vision.

Knights would clearly only have bothered with harness because it offered sufficient protection to outweigh these disadvantages. The large plates spread impacts sufficiently that cuts were largely ineffective, while thrusts would skid off the curved surfaces if they hit at an angle, and were

The difficulty of hurting a man in full harness meant that many of the plays taught for armoured fighting were primarily intended to put him on the ground where he could be dealt with at leisure, rather than injure him directly. Both fighters start off in a half-sword position. Dark thrusts at light's face. Light beats the tip of dark's sword aside, steps in and hooks his hilt around dark's neck. He then pulls hard backwards and towards himself, pulling dark backwards over his thigh and onto the ground. (Author's Collection)





Light has reversed his sword to deliver a *Mordschlag* ('Murder stroke') with the heavy sharpened cross of his sword. Dark steps forward to block light's sword with a strong parry, probably intending to follow up by pushing his left hand forward to displace light's sword and deliver a thrust to his face. Before he can do so, however, light pulls back on his sword, pulling dark's hands down and forward with it, then reverses direction abruptly to slam his pommel into dark's chin. (Author's Collection)

unlikely to punch through the plates even if they hit square. Fiore comments that while a single missed parry can mean death for a man wearing only a padded jacket, a man in good armour can receive multiple hits and still win the fight (Leoni & Mele 2017: 179).

Because of this, and because some unarmoured moves were awkward to perform in full harness, the fightbooks advocated special techniques. Fiore refers to it simply as 'sword in armour' while the German sources call it *Halbes Schwert* ('Half-sword'), *Gewappeter Hant* ('Armoured hand') or *Kurzes Schwert* ('Shortened Sword'), holding the longsword with right hand on the hilt, and the left gripping halfway up the blade. The longsword was then used like a short spear, with the left hand guiding the point against vulnerable points in the armour, such as the eye

Agincourt, 25 October 1415 (opposite)

Accounts of the battle of Agincourt often focus on the effectiveness of the longbow, but despite the casualties and disruption inflicted by English archery, French men-at-arms reached the English line, and the battle was resolved by brutal hand-to-hand fighting between knights. King Henry V of England (r. 1413–22) chose a battlefield with woods protecting his flanks to prevent the French using their superior numbers to best effect, set stakes to protect his archers from the planned French cavalry attack and forced the French to advance towards his dismounted men-at-arms across sloping, muddy ground. Henry fought in the front line to boost morale, making him an obvious target for glory-seeking Frenchmen. Chroniclers describe 18 Burgundian knights taking an oath to kill or capture the English king or die in the attempt – which they did – and Henry standing across the body of his wounded brother Humphrey, Duke of Gloucester, defending him until he could be pulled to safety.

Many of the French knights used shortened lances, and here Henry uses a half-sword parry to knock his attacker's thrust offline before delivering a counter-thrust to the face. Meanwhile, the next Englishman has blocked a swing and stepped forward to deliver a pommel strike to his opponent's face. Both Englishmen fight with visors raised for visibility and ease of breathing. Their French opponents needed their visors closed against the English arrowstorm, but now found themselves disadvantaged in close combat. Fighting with visor raised almost cost Henry his life at Shrewsbury in 1403, when an arrow in his face was only extracted with considerable difficulty and danger.





ABOVE LEFT

Vadi's specialized swords for use in armour, with flared spearpoint tips and spiked pommel and cross. It seems likely that the fighters wearing crowns rather than helmets was an artistic conceit. (Philippo di Vadi/Wikimedia/Public Domain)

ABOVE RIGHT

Plate harness provided excellent protection, and many armoured fighters focused on knocking their opponents down to finish them with a dagger thrust into unprotected flesh. In this illustration from Peter Falkner's 1495 manuscript, however, the victor has opted simply to use the sword he was already holding. (Peter Falkner/Wikimedia/Public Domain)



slots of the visor, the exposed face, palms of the hands, backs of the knees or the armpit. The latter might be protected by besagews, disc-shaped pieces of armour hung in front of the armpit to protect the gap exposed when the arm was raised, or by mail 'voiders' sewn to the padded arming doublet under the breastplate.

Other techniques included the *Mortschlag* ('Murder stroke'), where the attacker reversed his sword to hold it at mid-point and tip, using the heavy pommel and cross to deliver stunning blows to the head, jam harness joints by bending the metal or hook his opponent's knee from under him. Indeed, medieval harness protected its wearers so well that many armoured fighting techniques with longswords were intended not to injure the opponent directly but to trip, knock or throw him to the ground, where he could be held down and dispatched with a rondel dagger. This was a strong sharply pointed spike designed to slide easily through mail, into an eye slot or be hammered between the lames of a harness joint by pounding the flat pommel with the free hand. The Von Danzig *Fechtbuch* tells us that single combat in full harness often ended up in grappling and dagger fighting. A man in full armour was simply too hard to hurt unless you could knock him down, pin him and slide a dagger through the gaps in his harness (Tobler 2010: 158). Another master advised that having wrestled an armoured opponent to the ground and pinned him, you should grasp his dagger rather than yours, stabbing under the fauld of his armour into the exposed groin and inner thighs, and through the visor. If no gaps in the opponent's armour were obvious, he recommended cutting any visible armour straps and pulling up the plates to stab into the flesh beneath.

Mounted combat

The word 'chivalry' comes from the French for horse, and mounted combat was theoretically the epitome of knightly skill, though it became less decisive on the battlefield after the 'infantry revolution' of the mid-14th century. The joust became a pure sporting discipline with specialized equipment, and little connection with practical battlefield combat. The mounted 'free tourney' where teams fought each other using clubs retained more resemblance to real combat.

The primary mounted weapon was the lance, which concentrated the weight and momentum of charging man and horse into an impact capable of killing or injuring even the best-armoured opponent. The usefulness of the lance decreased sharply after the initial charge, however, as it was often broken or embedded in the first target, and depended heavily on the momentum of the charge. Mounted knights invariably carried swords as secondary weapons for use in the *mêlée*, and often hung a second, shorter weapon such as an axe or mace from their saddle-bow.

When drawing the sword while mounted, it was important that the right hand reached over the bridle arm to grip the sword hilt; reaching under risked slicing the inside of one's own left arm or the reins as the blade cleared the scabbard.

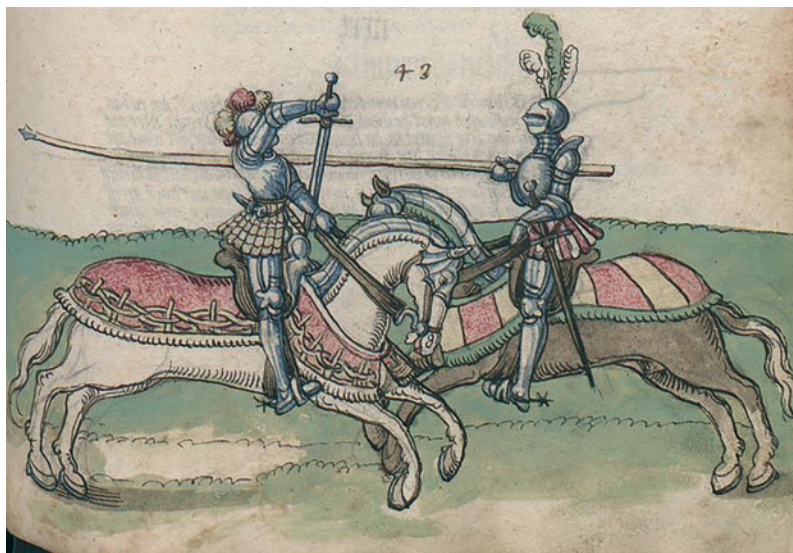
Even one-handed, the longsword's greater length gave an advantage when striking men on foot compared with a shorter sword, but it was important that the rider did not lean out of the saddle while striking – the shift of weight automatically made the horse move sideways, away from the pressure, causing the stroke to miss.

Alternatively, longswords could be used as short lances at canter, the point extended forward and driven home by the horse's momentum, though there was a clear risk of the sword over-penetrating the victim and being wrenched from your grip as you passed. Some sources suggest bracing the sword against the rigid breastplate when doing this, while Monte recommended resting the pommel on the saddle-bow, to transfer the force of impact to horse rather than rider.



Mounted fighting depended as much on horsemanship as swordsmanship, and as this plate from Hans Talhoffer's 1467 manuscript shows, for much of the time riders needed one hand to control the horse and thus used swords one-handed. (Hans Talhoffer/Wikimedia/Public Domain)

The lance clearly had the advantage of length against the sword, but if the swordsman could parry the point, he was safe. The inverted parry here was weaker than a more conventional parry, but allowed the swordsman to whip his weapon around in a strong cut at the lancer's head after parrying. This illustration comes from the German Goliath *Fechtbuch*, c.1510. (Ms. Germ. Qu. 2020 (from the former Prussian State Library in Berlin, preserved at present in the Jagiellonian Library in Kraków) f. 192r)

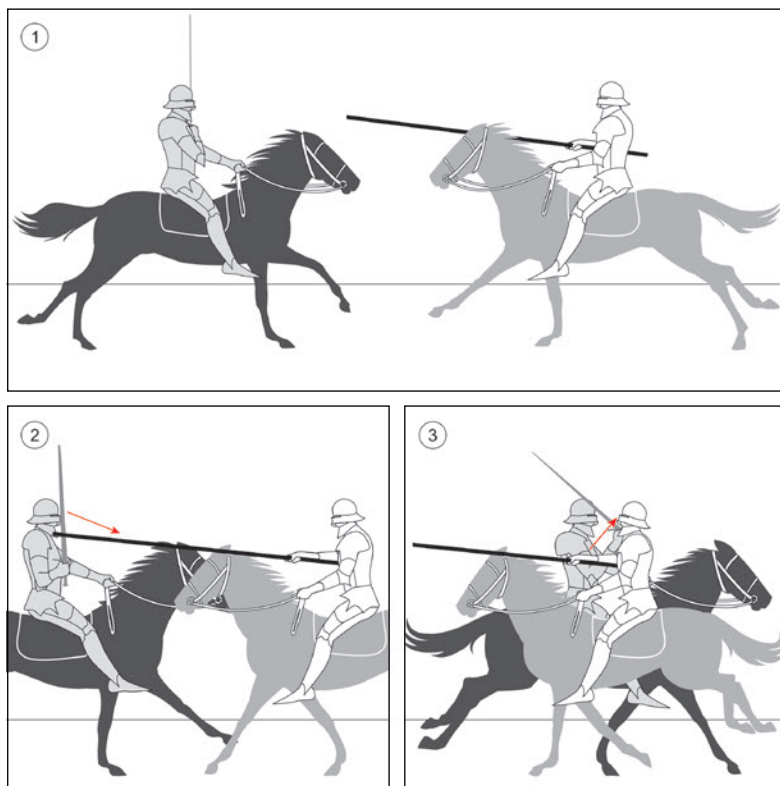


The distinction between armoured and unarmoured fighting does not affect mounted sword techniques. Crossbowmen and archers might be mounted primarily for mobility, and fight mounted only in an emergency, as would anyone attacked while travelling; the plates illustrating mounted combat in fightbooks show both unarmoured men and others in full harness.

Mounted fighting was obviously influenced by the rider being astride a horse, effectively eliminating footwork, and the need to keep the left hand on the reins to guide and control the horse. This largely restricted sword work to single-handed moves; some two-handed techniques are demonstrated mounted, though this required dropping the reins. Overall, the rider's position in the saddle meant he could attack or defend well to

Most mounted longsword techniques used the sword in one hand, but some sources (in this case the Goliath *Fechtbuch*, c.1510) show swords being used two-handed. This would obviously require dropping the reins, but it is worth noting that the horses are depicted as trotting, rather than the faster canter shown in the previous illustration. (Ms. Germ. Qu. 2020 (from the former Prussian State Library in Berlin, preserved at present in the Jagiellonian Library in Kraków) f. 189r)



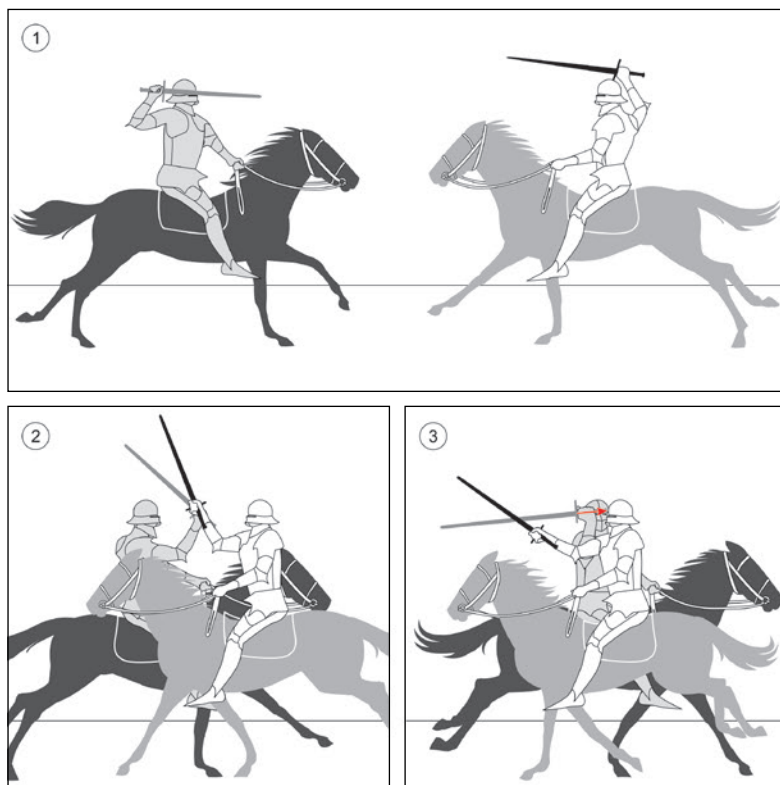


Light has a lance (1), which both concentrates the power of his charging horse into the tip and outreaches other weapons. Against it, dark deflects the lance tip offline (2), keeping the flat of his sword against the shaft to control his opponent's weapon as they close, then delivers a cut to light's face as he passes (3). Typically, this would be followed by a second cut delivered backhand to the rear of the target's head, in case the first was insufficient. (Author's Collection)

his right, but only with difficulty to his left and rear. In the open, this gave the superior horseman significant advantages if he could position himself to his opponent's left and rear, while his victim would attempt to disengage or turn his horse into a less unfavourable position – not easily done, with both horses moving fast.

A skilled horseman controlled his horse partly with his weight and legs as well as the reins, and could use this to sidestep attacks, while fit and well-trained horses, carrying more of their weight on the hindquarters, were more responsive and able to turn faster. King Duarte I of Portugal's equestrian textbook, *Livro Da Ensinança De Bem Cavalgar Toda Sela* ('Book of Teachings of Riding Well on Every Saddle', published as 'The Royal Book of Horsemanship, Jousting and Knightly Combat') written in the 1430s, advocates using the speed of the horse to add power to sword cuts, combining that energy with the strength of the rider's body, shoulder and arm. Severe wounds could be inflicted by combining the motion of the horse with the strength of the body and the arm to deliver a powerful stroke that was far stronger than one delivered by using the arm only (Dom Duarte 2005: 177). Duarte strongly advised maintaining the advantage of the horse's momentum in a fight, and avoiding sharp turns which put too much stress on its legs. Instead, he advocated delivering a strong sword cut on the way past the opponent, and slowing to turn for another attack once well beyond and out of immediate danger. Interestingly, fightbooks covering mounted combat also include sword moves at relatively slow paces (walk or trot) and grappling moves to pull

Both fighters are charging (1), using the momentum of their horses to add power to their sword cuts. Dark blocks light's blow from slightly below (2), and rolls his wrist to let light's sword run up his own blade, then drives his pommel into light's face (3). (Author's Collection)



opponents from the saddle. This discrepancy may reflect Duarte's focus on tournaments, or different audiences, with fightbooks assuming their readers already know the 'straightforward' techniques taught by Duarte, just as they assume they have already mastered horsemanship. The fightbooks therefore showcase their author's ability to teach 'advanced skills and dirty tricks' for use in close *mêlée*.

It was extremely poor form to attack an opponent's horses in a joust, leading to disqualification, while a defeated opponent's horses formed a valuable part of the prize in tournaments. The kill-or-be-killed logic of the fightbook authors showed no such restriction, and regarded killing or injuring an opponent's horse as a valid tactic. It was difficult to parry attacks to the horse's head and neck, where sword cuts were most likely to fall, so armourers developed plate shaffrons and articulated crinets to protect these areas, alongside plate bards to protect the horse's body from lance strikes and projectiles. Equally, one could cut an opponent's reins so he could no longer control his horse, leading to the appearance of reinforcing plates and chain reins.

THE LONGSWORD IN CONTEXT

The longsword's greatest strength was its versatility, and it was used in a wide range of circumstances – wars, tournaments, judicial duels and street brawls.



Swords were generally secondary weapons on the battlefield, and had to face a variety of different weapons, as shown in this French copy of the classical author Valerius Maximus, c.1473. (© British Library Board/ Bridgeman Images, Harley 4375, f.123)

The longsword in war

The changes driving development of the longsword during the 14th century also changed warfare itself, in what some have termed an ‘infantry revolution’. Cavalry remained vital for scouting and shock action, but units of trained, disciplined infantry – from English longbowmen to Swiss pikemen – were the decisive force on the battlefield. Even knights in full harness generally fought on foot.

Nobody with sense took a sword onto the battlefield as their main weapon, as they would be at a serious disadvantage against opponents equipped with long polearms. A swordsman could defeat a single

Bosworth Field, 22 August 1485 (overleaf)

Richard of York served his brother King Edward IV of England (r. 1461–70, 1471–83) loyally for decades, and after Edward died unexpectedly in 1483, he appeared a natural choice as Lord Protector until his brother's sons came of age. After seizing the throne for himself, Richard quickly found himself facing an unsuccessful rebellion led by the Duke of Buckingham – a former ally – then foreign invasion. Henry Tudor's disparate army of die-hard Edward IV loyalists, Lancastrian exiles, Woodville supporters and French mercenaries was united only by opposition to Richard, but gained local support as it advanced from its landing point in Pembrokeshire. Richard assembled a sizeable force, but when the armies met at Bosworth Field, much of it proved reluctant to actually fight for him. Whatever his other faults, Richard was no coward, and led his personal retinue in a charge directly at Henry Tudor's standard to break the rebel army and encourage his own forces to join in on the winning side. Ultimately, Richard came close to succeeding but was cut down and killed, fighting bravely to the last.

This plate shows one of Richard's retinue breaking through the thin line of archers defending Henry. The mounted knight uses the height and momentum of his horse to deliver maximum force in his cut. The archer has discarded his bow in favour of his longsword and the buckler carried looped over its hilt, and has two options. His safest course, given the knight is primarily interested in getting past the archers rather than fighting them, would be simply to use both sword and buckler together in a strong parry to protect his head (see inset). Alternatively, he could parry the cut with sword alone, and half-turn to wrap his buckler arm around the knight's sword arm and use the knight's own momentum to drag him from the saddle – a much riskier option, but one that might net him a valuable prisoner, with consequent rewards.





A scene from a Swiss chronicle, c.1483, shows longsword carried as sidearms by both armoured men-at-arms and unarmoured handgunners. (Burgerbibliothek Bern, Mss.h.h.I.1, p.32 – Diebold Schilling, Amtliche Berner Chronik, vol. 1)



spearman, because the swordsman had the advantage if he could get past the point of the polearm, and fightbooks show techniques for this. Fighting units of spearmen was a very different proposition, however, as they could pack together more closely than swordsmen, and anyone getting past one man's point would likely be spitted by his neighbour.

Equally, however, nobody with sense would go onto the battlefield without a sword as a secondary weapon, because it was the most effective weapon that could be carried on the belt. The spearman needed it in case the shaft of his polearm broke, the archer needed a weapon for when the

Three men fighting with longsword in a detail from a French manuscript miniature created c.1473. The man on the right has an unusual scabbard arrangement apparently fixed by chains to his mail shirt. Few of the other figures have visible scabbards, which may be artistic convention, or may mean that empty scabbards were discarded when swords were drawn. (© British Library Board/ Bridgeman Images, Harley 4374, f.161)



enemy made contact with his line, and the armoured man-at-arms needed a weapon that could be used both mounted and on foot, as his primary weapons of lance and pollaxe were tied to one mode of combat or the other.

The Burgundian Abbeville ordinance of 1471 prescribes longswords and daggers as secondary weapons for both mounted archers and light cavalymen, while cavalry swords remained viable well into the 19th century. The longsword was not the only choice in this role – the English seemed particularly fond of sword and buckler, while the Swiss often preferred short swords for use in the close press. It was the most versatile, however, as even unarmoured men could shorten their frontage by switching to half-sword techniques and using their weapons as short polearms.

Battle would see a mixture of armoured and unarmoured fighting techniques. Men-at-arms wore full harness, and by the Late Middle Ages even light troops such as archers would have worn helmets, breastplate or brigandine and possibly some limb defences, giving them some protection while retaining mobility.

To deliver good cuts, longswords needed space, which would probably only be available during the rout or pursuit after battle, when men were less tightly packed, though thrusts or half-sword techniques could be used at any point. Men also needed to train against a variety of different weapons, rather than just against other swordsmen.

Pitched battles were not especially common in medieval warfare. The weaker side often avoided battle, which usually occurred only if both sides thought they had a good chance of victory, or if one side was trapped against something preventing retreat, such as another enemy force or a river. The mounted raids known as *chevauchées*, skirmishes in rough country and sieges were as common as open battle, and here the longswords' versatility and ability to be used one-handed came to the fore – it is very difficult to carry a pollaxe on a scaling ladder, for example. Equally, swords worked under any circumstances, unlike bows or early gunpowder weapons which were useless in heavy rain and little more effective in darkness or fog which prevented the target being seen.

The longsword in tournaments and deeds of arms

Tournaments began as little more than pre-arranged limited wars, fought over an agreed area with the weapons and armour used in real warfare. Not surprisingly, tournaments were opposed by the Church, and even kings were cautious of permitting them, as they allowed discontented vassals to gather in numbers, fully armed. By the 14th century, however, they had acquired stricter rules, and used special weapons – the English Statute of Arms of 1292 stated that tournament weapons were to be blunted or rebated, swords were not to be pointed and lances were to have coronels rather than points.

Foot-combat events were separated from the mounted joust, and usually fought with the pollaxe (often simply called the 'axe') and the longsword. Sometimes even the number of blows with each weapon was

Two figures from the German chivalry romance *Rosengarten zu Worms* ('The Rosegarden at Worms'). One figure has both hands on his sword hilt, while the other may be intended as a half-sword grip. The elaborate helmet crests worn by both figures serve to identify them within the story, and may not reflect real practice. (Heidelberg University Library, Cod. Pal. germ. 359, fol. 46v)



specified, and with competitors wearing full harness, deaths and injuries were possible but unlikely. Though tournaments were still seen as good training for war, they became steadily less realistic, with jousting in particular gaining specialized armour which would be too heavy to wear in the field. This metamorphosis into a sport was why the French knight and author Geoffroi de Charny's 1350 *Livre de chevalerie* ('Book of Chivalry') valued deeds in tournament above those in jousts, and deeds in war above those in tournaments.

The process continued through time, and just as the joust acquired the tilt rail for added safety, foot combats also acquired 'barras' or barriers which physically separated the combatants, limited targets and prevented use of close techniques. First appearing in the late 15th century but becoming common in the 16th, they allowed knights – now a military aristocracy only in theory – to participate in chivalric spectacles without risk. Indeed, some became so circumscribed that participants no longer wore leg armour, as the strict rules prevented competitors crossing the barrier or striking each other below the waist. Though it survived into the late 16th century, as the last use of the longsword in armour, it had long lost any connection to actual combat.

Feats of Arms were a subset of tournaments, where individual knights or small groups challenged specific individuals or all comers in pre-arranged, 'friendly' combats. The combatants fought in full armour, with terms arranged in advance. Sometimes, the challenger chose one of a matched pair of weapons, and his opponent received the other.



Typically, such deeds involved a set number of courses (typically three, but sometimes five or seven) with lances on horseback, then with swords on horseback and finally on foot with spear or pollaxe, sword and dagger. Alternatively, the parties might agree to fight until one conceded or was forced to the ground, or each fighter might strike a set number of blows. For example, Sir John Cornwall travelled to Lille in 1409 to fight a three-day challenge against Jehan Werchin, Seneschal of Hainault, with lance, sword, dagger and pollaxe. He gained great honour and prestige from this, and was presented with a gold collar set with jewels by the Duke of Burgundy.

These contests were not necessarily bloodless. Combatants might choose to fight *à outrance* (perhaps best expressed as ‘to the extreme’) or *à plaisance* (‘for pleasure’). This is often assumed to be the distinction between combats with the normal sharp weapons of war and combats with blunted tournament weapons, but the reality was more complex. In fact, combats *à plaisance* could be fought with blunt or sharp weapons, but were intended to demonstrate the bravery and skill of the participants without causing serious injury. Combats *à outrance* raised the stakes and were expected to be fought until one party was dead, incapacitated or surrendered. The ‘pay-off’ for this greater risk was that combats *à outrance* were seen as showing much greater bravery, and thus gave the victor greater fame and glory.

Those offering to fight *à outrance* ensured their challenges were well publicized, or wore conspicuous tokens indicating their willingness to fight this way, publicly demonstrating bravery and confidence in their own prowess. They thus gained prestige even if the challenge did not

The so-called ‘Codex Wallerstein’ (Cod.1.6.4^o.2) was assembled by Paulus Hector Mair, a wealthy patrician and treasurer of the city of Augsburg, in 1556 from at least three earlier manuscripts; this section may date to the 1420s. Note the discarded spears and shields, mail voiders protecting gaps in the plate harness, and rondel daggers. (Codex Wallerstein/Wikimedia/Public Domain)



One of the 'Gladiatoria' series of manuscripts, depicting unscrewing the pommel of the sword to throw it at an opponent. (Wiktenauer/Wikimedia/Public Domain)

result in actual combat, which was a common outcome. Alternatively, combats *à outrance* might be fought during actual wars, allowing knights to fight each other in a fair and chivalric way. Perhaps the best example is the 'combat of the thirty' in 1351. This saw 30 Breton knights serving King Jean II of France (r. 1350–64) fight 30 Englishmen and their allies during the Hundred Years' War (1337–1453). The fight took place midway between the two sides, with strict rules which prohibited outside interference and even allowed refreshment breaks. The fighting itself was entirely in earnest, however, with more than a dozen combatants killed and many of the rest wounded.

Deeds of arms superficially resembled judicial duels, but were actually worlds apart – the combatants might not even know in advance who they would fight, there was no requirement to fight to the bitter end, and an ideal resolution would see both participants gain fame, honour and potentially monetary reward. Occasionally, combats were offered which bridged the divide between the two, as when King Henry V of England (r. 1413–22) suggested before the 1415 Agincourt campaign that he and the Dauphin of France preserve the lives of their Christian subjects by meeting in single combat, with the survivor recognized as true heir to the French throne. This has often been regarded as mere chivalric propaganda, but one suspects Henry would have been entirely willing to fight had the challenge been accepted; he was in his prime and an experienced fighter, whereas the Dauphin was notoriously overweight and indolent.

The longsword and the judicial duel

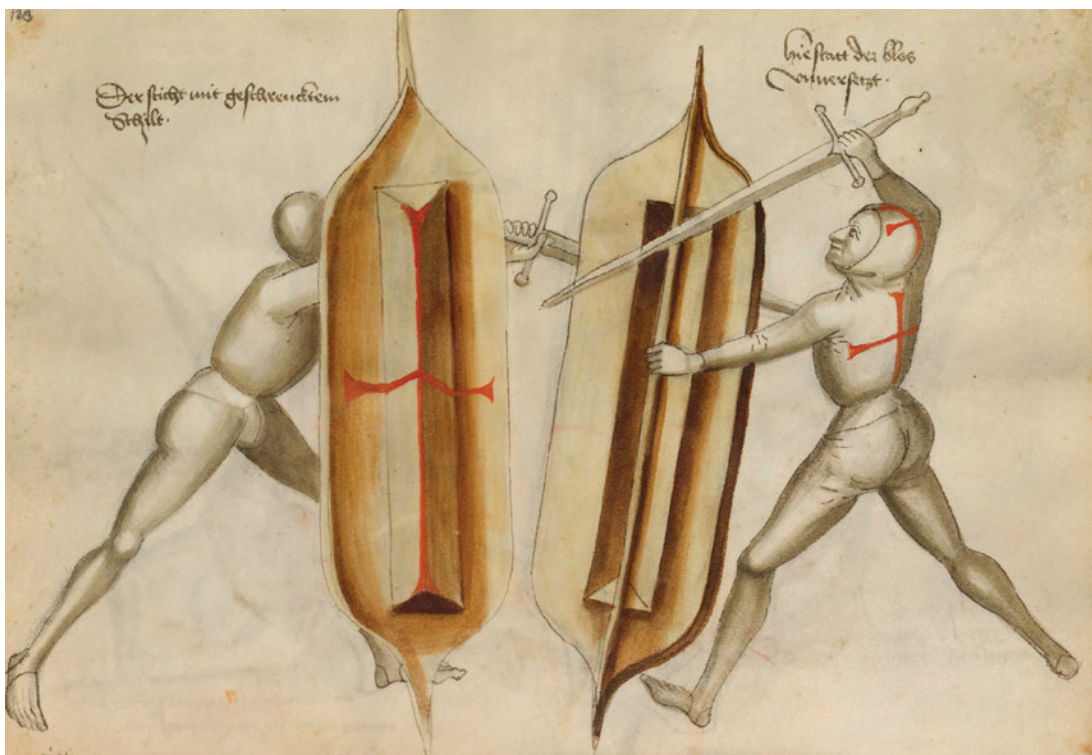
The medieval judicial duel had little in common with the post-medieval 'honour duel' fought with rapiers or smallswords. The latter was an illegal combat fought because individuals felt their personal honour was slighted. By contrast, its medieval equivalent was actually part of the legal process, fought over a serious crime.

The judicial duel originated in the early medieval 'Trial by Combat', which could originally be used in any type of legal case, including property disputes. It followed the same logic as the other legal ordeals such as trial by fire or water, essentially relying on divine intervention to show which side of the dispute was right. The other ordeals fell into disuse with the re-introduction of Roman-style law and clerical opposition after the Fourth Lateran Council in 1215, which held that requiring miracles constituted temptation of God. Trial by combat required neither miracles nor clerical participation to produce a result, however, and survived, albeit in much-reduced form.

Victorian writers saw judicial duels as examples of medieval barbarity and irrationality. In actuality, they were pragmatic solutions to crimes without witnesses in a world without forensic technology. Their primary purpose was not to determine the truth, but to provide a mechanism for resolving serious disputes which might otherwise result in the endless and self-sustaining feuds seen in Norse sagas or the vendetta of medieval Italy.

The French ordinance of 1306 (which replaced an attempt to ban judicial duels from 1258, with limited success) was typical, and allowed them only in a very limited set of circumstances. First, a crime must clearly

Several medieval manuscripts show commoners fighting judicial duels with large spiked or hooked shields, either on their own or with wooden clubs, but this 1467 manuscript by Hans Talhoffer shows them being used with longswords. The close-fitting fighting suits were apparently made of greased leather. (Hans Talhoffer/Wikimedia/Public Domain)





Many armoured duels seem to have started with spears, which might be thrown at the opponent (as the figure on the left seems to have done) or used in hand, before switching to swords. This illustration comes from another of the 'Gladiatoria' series of manuscripts. (Kunsthistorisches Museum Ms. KK5013/Wikimedia/Public Domain)

have been committed. Second, as at least one combatant was likely to die, the crime must be punishable by death. Third, there must be reasonable grounds to suspect the accused. Fourth, there must be no other way to prove or disprove the matter by witness testimony or documents.

As states became stronger during the 14th century, judicial duels generally required royal permission, though some jurisdictions such as Brittany, Burgundy and some independent towns jealously guarded their right to permit them. Judicial duels continued throughout the Middle Ages, but were rare, and never formed a routine part of medieval legal systems. Even when they were invoked, this was often a negotiating tactic to pressure opponents into settlement, rather than real intent to fight. Indeed, it was even possible to halt a duel that had begun in order to negotiate.

Children, clergymen, the elderly and the infirm were exempted from fighting, though the level of disability which prevented men fighting varied. A missing eye or limb was always sufficient, but sometimes even missing front teeth was enough. Women were generally exempt, though Talhoffer shows an odd example where a woman does fight. Some towns also obtained exemptions from their inhabitants having to fight judicial duels.

Commoners could fight judicial duels, and many recorded duels were between burgesses or craftsmen, as when the English servant John Davey killed his master, the armourer William Catour, in a 1447 duel after accusing him of uttering treasonous words and prophecies against the king. Commoners could rarely challenge nobles, however, and any noble

foolish enough to challenge a commoner was effectively required to give up any advantages of equipment and opened himself to ridicule by lowering himself to fight a social inferior. Commoners and townsmen usually fought either with clubs and shields, or specialized two-handed spiked duelling shields, though unarmoured fights with longswords happened occasionally, especially in Italy and Germany. Nobles might start mounted with lances and finish the fight on foot with longswords, or go straight to dismounted fighting with pollaxe or longsword in full harness. In either case, if the duel was fought out, the loser would generally be hanged for perjury. Indeed, the fight often took place in the shadow of gallows erected for exactly that purpose. No quarter was asked or given, and no trick or ploy was forbidden. The sole aim was to win and survive.

After the initial accusation, the accused was only held in prison if he was likely to flee. Respectable men would generally be released on sureties, allowing them to settle their affairs and train, knowing that failure to appear on the day would be regarded as confession of guilt. Talhoffer (1459) says that both parties had six weeks to prepare, which should be spent training with a respectable fighting master. Indeed, much of the material in the fightbooks seems geared towards such duels. Talhoffer



Chivalric duels might start on horseback and continue on foot, as depicted in this illustration from the *Romance of Pontus and Sidonia*, produced for Margarethe of Savoy, c.1475. (Heidelberg University Library, Cod. Pal. germ.142, fol.22r)

advocates hearing mass each morning, practising for two hours in the morning and another two in the afternoon, and eating a light, healthy diet. On the day itself, both combatants attended mass and confession, putting themselves in a state of spiritual grace before battle.

Duels usually took place within substantial wooden lists, to contain the fight and prevent it spilling into the crowd. Chairs or pavilions were set at opposite sides for the combatants, who generally entered armoured except for helmet and gauntlets. Officers of the court confirmed their identities and inspected weapons to ensure fair play. The accuser then stated his accusation and swore to its truth, while the accused swore his innocence. Both combatants then swore that they employed no magic or spells. This was not as unlikely as it might sound: in 1355, a champion of the bishop of Salisbury was found to have rolls of prayers and spells hidden in his equipment. The discovery merely resulted in the fight being delayed, and the two sides ultimately struck an agreement. Finally, officers of the court ordered silence from the crowd, with severe penalties. Aside from heightening the spectacle, both sides might have partisans in the crowd, and disorder, violence and riot were real concerns. Even nobles were sometimes forbidden to bear weapons while witnessing combats.

Obviously, such duels could be abused. One complaint against King Richard II of England (r. 1377–99) after his deposition was that nobles were maliciously accused of treasonable words against the king, then arrested and tried in a special court which effectively forced them to defend themselves by a judicial duel against young, strong and well-trained accusers, even if the nobles accused were themselves old or infirm (Neilson 2000: 193).

The longsword and the duel of honour

Alongside the judicial duel, medieval nobles could also fight public ‘Duels of Honour’. No crime was involved, merely words or deeds that a noble felt diminished his honour. For example, the *Condottiere* (mercenary captain) Galeazzo da Mantova – one of Fiore’s students – challenged the French knight Jean II Le Maingre, Marshal of France (better known as Marshal Boucicaut), after the latter disparaged the courage of Italians at a banquet. Such duels were public events, and needed permission from the local lord. The duel above was finally fought at Padua in 1395, after other lords refused permission, and attended by huge crowds.

These duels were generally fought in armour, either on foot or mounted with whatever selection of weapons the participants agreed – usually spears, longswords or pollaxes, for foot combat. Such duels were rarely fought to the death, and indeed were often terminated by the sponsoring lord before either party was seriously hurt, as in this case. These were initially public and legitimate, but increasing disapproval by monarchs and the Church made it harder to gain permission for such duels, forcing those who wanted to fight to do so privately, without legal sanction. Ultimately, these private duels evolved into the classic illicit post-medieval duel.

TRAINING TO USE THE LONGSWORD

No weapon is effective unless one knows how to use it. Training with the longsword started early, with medieval writers suggesting boys should start learning to fight aged 12–14, alongside other ‘knightly’ skills such as music, chess, dancing and courtly manners. Edward the Black Prince not only fought at Crécy in 1346 aged 16, but asked his father King Edward III of England (r. 1322–77) to place him where the fighting would be fiercest. Similarly, the future King Henry V of England was wounded commanding the vanguard at Shrewsbury in 1403, also aged 16, and King Edward VI of England (r. 1547–53) is described practising fencing in 1551, when he would have been 13.

Weapons for children appear in medieval household accounts: the sword of the future King Henry V of England (at that time heir to the earldom of Derby), is mentioned in 1397 when he was nine, and that of his 11-year-old brother John was burnished for 4d in 1400–01. According to household accounts, eight swords of various sizes were purchased for the young King Henry VI of England (r. 1422–61) in about 1430, when he was nine, and his master the Earl of Warwick also had a suit of armour made for him, decorated with gold (Orme 1984: 183–84). Similar child-sized armours survive in several European collections.

Just as boys learned to joust against the quintain, swordsmen practised at the pell. This was a heavy post of roughly man height, sunk into the ground for stability. It worked like a boxer’s punching bag, teaching students to strike strongly, swiftly and accurately at an opponent. Special practice weapons were probably used against the pell, as being struck repeatedly against it would blunt and damage real swords. Many medieval authors recommended that these practice weapons be heavier than real ones, to build strength. Both the pell and use of double-weight training weapons first appear in the works of the 4th-century AD Roman author Vegetius, whose books were widely read and translated during the Middle Ages. Numerous reformulations of Vegetius’ work, such as the 15th-century English *Knyghthode and Bataile* (‘Knighthood and Battle’), plus references in Monte and other authors show that this was still regarded as good practical advice, however.

A pell was no substitute for live opponents, however. Training with sharp swords was obviously unwise, and we hear of training swords or ‘wasters’ made from wood or whalebone, and blunted training weapons. Such training could turn into a sporting contest, with multiple participants on each side. The Italian diplomat Dominic Mancini noted in 1483 that on holidays, English youths would fight in the streets with shields, blunted swords and staves (Mancini 1984: 99–100). Mancini should not have been surprised; the half-sporting, half-serious *Guerra di canne* (‘stick wars’) fought on holidays between districts of several Italian cities – notably Venice and Pisa – for control of bridges between them were first attested in 1369, and continued into the 18th century. Though safer than training with real weapons, such practice still had risks. Several English pardons survive, absolving men from punishment after accidentally killing opponents in stick fights.



A knight training with a sword against a simple wooden pell, from a miniature in Jean de Meung's *L'Art de Chivalry*, created in France 1284–1325. (© British Library Board/Bridgeman Images, Sloan 2430, f.2v)

Tournaments provided similar opportunities for knights, and the lifting of the papal ban on tournaments in 1316 explicitly stated that lack of tournaments was preventing men training as knights and thus depriving Christendom of trained manpower for the crusade. Fitness and stamina was vital for fighting successfully, especially in armour. The Norwegian *Konungs skuggsjå* ('The King's Mirror', 1250) states that a household knight should train in heavy armour every day. Few men went as far as Marshal Boucicaut, who trained by walking and running long distances in full armour, and wearing it to turn somersaults, vault onto his horse and climb walls alongside more conventional practice.

While Boucicaut's training regime was described exactly because it was exceptional, Ramon Lull's 13th-century work *Libre qui es de l'ordre de cavalleria* ('Book of Knighthood and Chivalry'; Lull 2001) urges knights to practise jousting, and to participate in tournaments and hunting, to make themselves strong in prowess, while both Talhoffer and Pietro Monte discuss improving and maintaining fitness by running, vaulting and throwing heavy stones. They also recommended wrestling, as an important foundation for all other fighting arts.

Not all knights trained so diligently, however. By the Late Middle Ages, many spent their time as estate managers, royal administrators or judges, rather than as active combatants. Geoffroi de Charny mocked fat knights who could no longer fit into their armour, while King Jean II of France created his 'Company of the Star' in 1342 partly from concern that many knights had become unused to weapons and short of exercise

(Charny 2005: 21). William Caxton fretted over the decline in knightly skills in the preface to his 1494 printed edition of Lull’s book, and Hans Talhoffer assumed even knights needed intensive training to prepare for duels. Generalizations are thus difficult. Mancini’s comments on the strength of English archers are supported by indications of good musculature on skeletons from the battle of Towton (1461) graves or the sunken Tudor warship *Mary Rose*. Bodies from the battle of Visby (1361) mass grave, however, included men who were clearly elderly or suffered from debilitating physical conditions such as arthritis, who could not have been effective combatants but still found themselves having to fight.

Fencing schools

Boys of knightly status learned to fight from family retainers or as pages in another noble’s household; several masters of the German tradition such as Jude Ott and Sigmund ain Ringeck seem to have been employed in this capacity by lords, and Fiore acted as a trainer to several nobles. The fightbooks themselves seem to be aimed at those rich enough to afford armour and horses; they focus on the armoured duels likely to interest them, may use a pedagogical framework that the educated would recognize and are explicitly contemptuous of the lower classes.

Professional fighting schools also existed, however, catering primarily to the urban lower and middle classes. In England, such schools were

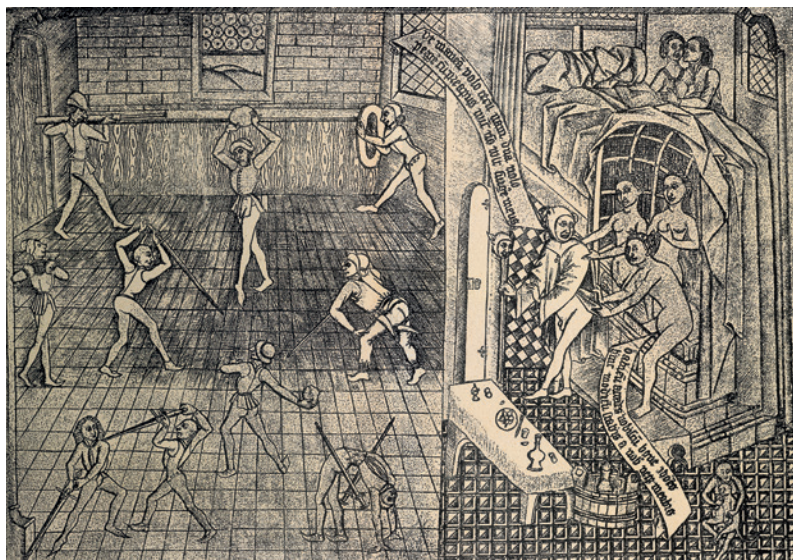
DARDI'S SCHOOL

Filippo di Bartolomeo Dardi ran a fencing school from 1413 to 1464 in the Italian town of Bologna, famous in medieval times for its university. His 1443 agreement with the town council survives. Dardi proposed a set of fees for teaching fencing, while the council proposed much lower ones. Both sides regarded teaching citizens to fight as having clear public benefit, and ultimately compromised between the two rates in return for Dardi reducing the 200 lire the council paid him annually for practising astrology. He also received other benefits, including a university position.

Dardi estimated that students needed five months to learn the two-handed sword: a longsword, in our terms. This was almost twice the time for sword and buckler, perhaps reflecting more techniques to master. Dardi anticipated getting the maximum of 20 students he could teach at a time, and would teach them for two hours a day, split evenly between theory and practice. Modern earnings equivalents for his fees would be around \$6–7 per hour for group lessons, roughly comparable to modern gym classes.

DARDI'S FEES					
Weapon	Months	Dardi's proposal (lire)	Rates set by the council (lire)	Agreed cost (lire)	Hours
Two-handed sword	5	23	8	10	300
Sword and buckler	3	7	3	4	180
Dagger	2	12	5	6	120
Stick	2	7	3	4	120
Wrestling	2	10	4	5	120

This image of a combined fighting school and brothel epitomizes the rather dubious standing of many 15th-century fighting schools. Note the men lifting and throwing rocks to improve strength. (© British Library Board/ Bridgeman Images, Cup.820.PP9, page 136)



associated with rowdy behaviour and after 1280 keeping one was punishable by imprisonment for 40 days. One ‘Master Roger le Skirmisour’ was imprisoned for doing so in about 1310, because his school was attracting the sons of respectable citizens, causing them to waste their money and get in trouble. In the 1480s, students at the University of Oxford were banned from practising with two-handed swords or swords and bucklers (along with handball and gambling) on

***Fechtschule*, Frankfurt, 1530 (opposite)**

By the 16th century, fighting masters praised the longsword as a noble and aristocratic weapon, but in reality it had become a sport and training weapon used by a mostly bourgeois audience who were unlikely to own armour. *Fechtschulen* (public fencing competitions) were generally single events, though many towns held them most weeks from April to October. They resembled competitions rather than what we would regard as a school. Though weapons were blunted and wrestling, thrusts, pommel strikes and other ‘dangerous’ blows were forbidden, bouts were still won by inflicting bleeding scalp wounds on opponents, which at least gave clear, simple results without subjective judgement.

Contestants often recited insulting ‘*Fechtschule* rhymes’ about their opponents, and bouts were supervised by ‘sticklers’ who used their staffs to separate the combatants if necessary. Such events could be well attended, and often included processions with drums and cash prizes, but they lacked the status of the shooting contests sponsored by Flemish and German towns. The latter drew competitors from far and wide, and included parades, feasts and other competitions. Indeed, these elite events might include *Fechtschulen* themselves, as a kind of sideshow, and the *Marxbrüder* tested prospective new masters at Frankfurt’s large annual fair.

The closest pair of fighters demonstrate longsword techniques using practice *Federschwerter* (‘feather swords’), which could still cause injuries or even death despite being blunted. Behind them, a second pair fight with the wooden *Dussack*, another common sparring weapon, while previous combatants celebrate their victories or drown their sorrows.



penalty of 4d fine, and fencing masters were specifically listed in the 1529 statute against vagrants and vagabonds. In Germany, better regulation meant fighting schools were more orderly and thus tolerated, though masters still needed permission from town authorities to hold *Fechtschulen* (public fencing competitions, rather than schools per se) and 1472 regulations from the University of Ingolstadt prohibited students from keeping armour or any weapon except small knives.

The first professional guild of fencing masters was the Brotherhood of Saint Michael in Bruges, in existence from at least 1456. This was followed by the famous 'Brotherhood of Saint Mark' or *Marxbrüder*, attested from 1474 and given a charter of privilege by the Holy Roman Emperor Frederick III (r. 1452–93) in 1487. This gave them a monopoly on teaching fencing and appointing masters in the German lands, though in practice there were also numerous 'free fencers' also sometimes known as the *Federfechter* ('feather-fighters').

Victorian historians believed the *Federfechter* were named for the new 'feather-like' rapier, but this seems unlikely as both societies taught the same weapons. After 1607, the *Federfechter* also gained a grant of privilege, giving them equal rights with the *Marxbrüder*. A third society existed – the Brotherhood of Saint Luke – but little is known of them.

In England, the London Masters of Defence only received letters patent from King Henry VIII of England (r. 1509–47) in 1540, authorizing them to seek out unlicensed teachers for prosecution by the authorities. Although watching aspirants playing for their master's prize was a popular Tudor entertainment attended by Henry VIII and his successors, the London masters were unable to defend their monopoly against well-connected immigrant Italian rapier masters as effectively as the Germans did, and ultimately lost all influence.

All these societies had rules for progression through various ranks (Scholar, Free Scholar, Provost and Master, in England) by open competition involving multiple bouts against existing members. Defeating all opponents was neither likely nor required; candidates only needed to demonstrate competence with various weapons. Aspirants also swore to live honest lives, not to fight their master or to reveal the secrets they were taught.

Teaching sword fighting was not necessarily lucrative. Fiore claims that he was paid well to teach high-status pupils, but most itinerant masters barely scraped a living travelling from town to town. Those teachers making applications to hold *Fechtschulen* sometimes emphasized their poverty, or even asked for money to travel to the next town if the application was refused. Others taught swordsmanship as a sideline. While many fightbooks emphasize the noble and knightly nature of the fighting arts, most men applying to hold *Fechtschulen* or connected with the *Marxbrüder* were members of craft guilds, especially the knife makers and furriers. Philip Treher, hired in 1446 by King Henry VI of England to train John Davy for his judicial duel, was a London fishmonger by trade.

It could also be a dangerous job. Aside from accidental injury, Fiore says he had to fight five times against jealous rival masters, and fights between fencing masters – sometimes with sharp weapons – were common ways to build reputations or prevent another entering the limited market.

Footwork

Despite the importance of footwork in sword fighting, few German *Fechtbücher* discuss it – they were not intended for novices, and assumed students knew the basics. Even Meyer, despite saying footwork is vital, apologizes for discussing something which could be learned in the marketplace. By contrast, Fiore does mention how one should step.

Modern fencing generally uses ‘gathering steps’ with the feet in the same line; the rear foot steps almost up to the front foot then the front foot steps forward. This works well with thrusting weapons, and appears in fightbook sections on (for example) spear fighting. By contrast, most longsword techniques used ‘passing steps’, where the rear foot steps past the front foot, and becomes the new front foot. This allowed the fighter to deliver much stronger blows from the shoulders, rather than the elbows or wrists; the Ringeck manuscript tells us to fight with the strength of the whole body. Footwork also allowed one to step backwards or out of line to avoid attacks, and Fiore advocates controlling distance to your advantage, moving from wide play (primarily cuts and thrusts) to close play (utilizing cross or pommel strikes and grappling). Presumably the fighter choosing to close expected this to benefit them, and Monte warned against letting stronger fighters close with you.



Two figures with longswords from the 1435 *Heilsspiegelaltar* by the German painter Konrad Witz (c.1400–c.1445). The armoured figure on the left wears a box-shaped *Kastenbrust* breastplate, and the scabbard of his sword appears to be attached directly to the tonlet skirt of his armour. (Konrad Witz/Wikimedia/Public Domain)



The young Holy Roman Emperor Maximilian I learning to fight with a longsword in a woodcut by Hans Burgkmair, c.1500. Note the 'stickler' ready to step in to stop the fight if necessary, and the other weapons (including a pair of machete-like *Messer*) lying on the floor. (© Royal Armouries RAL 11620)

Wearing full harness changed one's balance as well as providing protection, and Monte says that in armoured combat, one should keep light on the feet and not let them get too far apart. Pitched battles obviously offered less scope for clever footwork, and Monte notes that while a person fighting a single opponent can readily move forwards, backwards or sideways, men in close order are compelled to manoeuvre as a bloc and move their limbs together (Forgeng 2018: 202).

Hand position

As with footwork, fightbooks assumed students already knew how to hold a sword. The usual grip placed the dominant right hand closest to the cross, so the weapon could be used one-handed by releasing the left hand if necessary to grapple. Alternatively, the left hand could pull back on the pommel while the right hand pushed forward, increasing leverage in a cut. A longsword gripped two-handed did not automatically have longer reach than a single-handed sword, but Fiore shows sliding the right hand down onto the pommel, giving a longer (if presumably weaker) thrust. Illustrations sometimes depict the right thumb placed against the flat of the blade, or a forefinger hooked over the cross. This offered better blade control, but exposed the forefinger to damage.

Destroying opponents' hands quickly removed their ability to continue fighting. Monte comments that wielding the two-handed sword teaches the user to move, rotate and protect his own hands while making efforts to attack his opponent's (Forgeng 2018: 117). Indeed, longsword guard positions generally had the hands drawn well back out of danger, especially when compared with 16th-century rapiers, where the sword-hand was much further forward, protected by the complex hilt, or with sword-and-buckler systems, where the buckler protected the sword-hand. With this vulnerability, it is surprising that unarmoured fighters did not wear protective gauntlets on occasion. Even some figures demonstrating half-sword work in armour do not seem to wear them, however.

There is no medieval evidence for 'dual wielding' with a sword in each hand so beloved of movies and video games, though both Fiore and the 'Gladiatoria' *Fechtbuch* demonstrate throwing swords like javelins.

Parries and defence

The early medieval knight was armoured in mail, and fought with a single-handed sword paired with a shield in the left hand. This could be used offensively – to bash opponents backwards – but was primarily defensive. Longswords could be used one-handed with shields – several sources show them used with large spiked shields in judicial duels – but this was unusual. Using longswords with a buckler was more common, particularly for lightly armoured men such as archers, who carried a buckler hooked over the hilt of their sheathed sword. Generally, however, longswords were used alone, and had to provide both attack and defence. They provided several defensive options, to suit various situations – armoured men might prefer different choices to unarmoured ones, or even have sufficient confidence in their harness simply to take the hit.

The best defensive option was to attack first, forcing one's opponent to parry instead of attacking. While parries and blocks were as important as strikes, the sources stress that they could only be temporary pauses before returning to the attack, rather than positions in which to rest and passively let your enemy attack you. The Nuremberg *Hausbuch* comments that when a swordsman always waits for the strike of his opponent and simply parries, it proves disastrous and he is beaten. True safety lay in killing or incapacitating your enemy.



The late 16th century saw the development of longsword-sized single-edged weapons known as *Schweizersöbel* because they seem especially common in Switzerland. These often have a slight curve, and may feature reasonably extensive handguards. The first 15in of the back edge of the blade was sharpened on this example. (© Royal Armouries IX.156)



ABOVE LEFT

Carrying a buckler looped over one's sword hilt gave lightly armoured troops a useful defensive option. This plate from Paulus Kal's late-15th-century manuscript shows what are clearly longswords being used with bucklers, though single-handed swords were often employed, with identical techniques. Most bucklers were shallower and more practical than the rather baroque examples here, however. (Paulus Kal/Wikimedia/Public Domain)



ABOVE RIGHT

The meeting of Saint Erasmus and Saint Maurice, painted by Matthias Grünewald (c.1470–1528), c.1520. Saint Maurice was the commander of the legendary Theban legion in the 3rd century AD, supposedly martyred for refusing to lead his men against fellow Christians, but is dressed in contemporary armour, including a longsword. (Matthias Grünewald/Wikimedia/Public Domain)

The next choice was to void the attack by stepping back out of reach. This meant your own weapon was not engaged and you could step back in quickly to strike before the opponent recovered. It required space into which to retreat, however, and was difficult in confined spaces or a battle line.

The third option was to deflect the opponent's attack, using your blade to change the direction of an attack without absorbing its force. Almost by definition, such redirection created an opening for the defender to step into and counter-attack, usually from inside the attackers' guard, forcing them to give ground to even attempt a parry.

Finally, one could block the opponent's sword with one's own, absorbing the energy of the attack. This was a secure defence, but harder to counter-attack from except by 'winding' one's blade around the opponent's.

For both deflection and blocks, the strong of one's own sword was generally used against the weak of the opponent's sword, for best leverage. Ideally, one blocked with the edge of one's own sword against the flat of the opponent's. Although edge-to-edge parries are clearly described in earlier works such as Norse sagas and later works such as Victorian sabre manuals, some HEMA enthusiasts believe that edge parries were not used in the late medieval period. They argue that such parries would rapidly damage a weapon's edges, whereas museum examples rarely display such damage.

This is true, and indeed the fact that two blades meeting edge-to-edge tend to bite into each other and slightly 'stick' allows one to apply pressure to an opponent's weapon in some moves. Such damage rarely made swords unusable during the fight itself, however, and men who survived

by parrying with the edges of their swords would simply replace them afterwards. Only undamaged examples would be kept and end up in museums. Similarly, few museum armours show damage, although armour was certainly expected to be hit. Finally, medieval descriptions of sword blades being heavily notched during combat do exist.

Ultimately, this is misplaced controversy. Even if those advocating parrying with the flat are unduly influenced by Japanese traditions, such flat parries probably occurred with medieval longswords, especially when deflecting opponents' blades. Equally, edge-to-edge parries also occurred either deliberately or under the stress of combat, where survival depended on whether cuts were blocked rather than exactly how it was done. Indeed, as few edge-to-edge parries are at exactly 90 degrees, the two categories shade into each other.

CARING FOR SWORDS

Although steel is tough, it rusts quickly in the wrong conditions, though men probably spent less time keeping their swords in good condition than maintaining their armour. Swords would inevitably be exposed to damp conditions on campaign, and both horse and human sweat – inseparable from medieval warfare – could rust steel especially quickly because of their high salt content. Blades were treated with olive oil or grease to protect them, and surface rust could be polished away with a cloth, or with abrasives such as sand or ash. Blood was particularly corrosive to steel, and had to be wiped away as quickly as possible. A bloody blade re-sheathed without doing so would corrode into its scabbard, making it impossible to draw again.

Cutting edges could become notched or blunt if they struck bones or armour. Large notches might be hammered or filed out, while blades were re-sharpened using whetstones. It was important to keep whetstones at the correct angle while drawing them along the length of the blade to avoid accidentally changing the angle of the cutting edge. As whetstones removed material each time, repeated re-sharpening would ultimately remove the entire hardened steel cutting edge.

An image of the apostle Paul from a book of hours created in the Netherlands, c.1500. (© British Library Board/Bridgeman Images, Kings 9, f.34v)





IMPACT

At the sharp end

PRICES AND AVAILABILITY

In the Early Middle Ages (400–900) swords were expensive and poorer men made do with cheaper weapons such as spears. Simpler manufacturing processes replaced complex and time-consuming pattern-welding, however, and the relative prices of swords dropped steadily through the Middle Ages. By the Late Middle Ages (1350–1500), swords were relatively cheap, though accounts do not always distinguish between types, and there was considerable variation – the obvious parallel is the cost of handguns in the modern United States.

Very cheap swords could be bought second-hand for less than 1s. Account books from the Tower of London in the 1360s include purchases of 86 swords at 3s 4d each, and another 19 swords at 2s each, presumably for munition-quality weapons. Two lists of goods owned by relatively wealthy London merchants from the 1390s include one longsword for 6s 8d and a longsword and buckler valued at 10s, presumably for higher-quality items. For comparison, the Tower purchased 4,012 painted bows at 2s 6d each and 2,105 ‘white’ bows at 1s 4d each in 1353–60. Bascinet with mail aventails ranged between 17s 3d and 24s. Pairs of plates for torso protection cost 13s 4d for plain hemp-covered ones, £1 6s 8d for better-quality examples covered in fustian and £2 for fine ones covered in velvet with gilded rivets, while full suits of plate harness were £6–10. A good riding horse might cost around £2, and trained warhorses £10 and up.

The prices above are in English currency, though prices elsewhere seem broadly equivalent. Typical daily wages were 3d for foot archers and 6d for mounted archers providing their own horses, or 12d for armoured men-at-arms with ‘covered’ warhorses. Labourers might only earn 2d per day while skilled craftsmen might earn 3–6d. A munition-quality sword thus cost an archer roughly ten days’ wages, while a man-at-arms might pay the same

number of days' wages for a higher-quality example. In both cases, the sword was a relatively small proportion of the cost to outfit the man for battle.

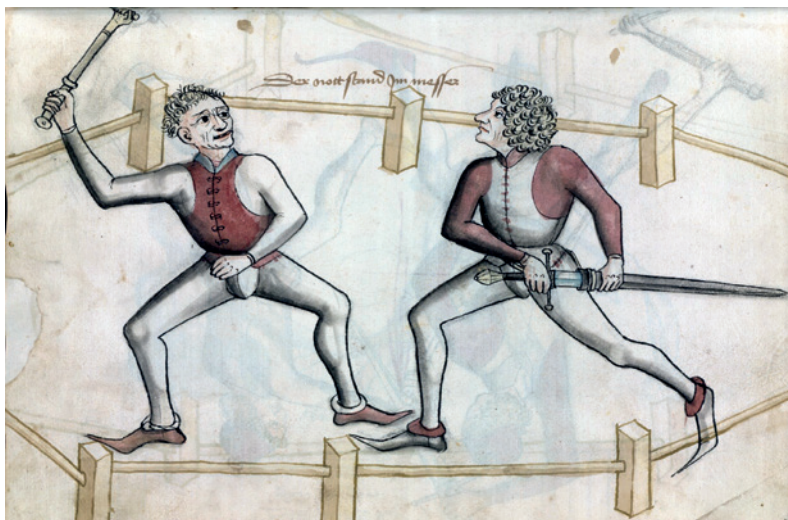
Other documentation from the period also indicates affordable swords, such as a 1380 order for the London aldermen to muster the men of their wards with haubergon, bascinet, plate gauntlets, pollaxe and sword, while even 'inferior men' were to be arrayed with bow and arrows, sword and buckler.

A 1396 English textbook for learning courtly French even included a dialogue with a baker's apprentice telling his master that he hurt his hand practising with two-handed swords (almost certainly longswords) and cannot work. While fictional, it shows that even lowly apprentices might plausibly have access to longswords.

BEARING ARMS

Medieval states rarely restricted the right to own weapons. Indeed, where laws about owning weapons existed, they were generally to require ownership, rather than to forbid it. The Italian politician and historian Niccolò Machiavelli claimed that an armed populace with military training made better citizens, because military virtues such as courage and respect for authority translated into civic virtues. The free cities in Germany, Italy and the Low Countries depended on citizen militias for defence, and required citizens to equip themselves properly. The Italian humanist Enea Silvio de Piccolomini – the future Pope Pius II – noted in 1444 that in German cities, every guild member owned an array of weaponry and the average citizen's skill with weapons was impressive (Tlusty 2011: 1).

Citizens were a privileged sub-category of the urban population, usually restricted to guild members and people of some economic substance, but these privileges were matched by obligations including militia service and rotating duty in the town's watch, protecting against criminal activity and fire. House-holding widows and old men paid



A sword was no use if you could not draw it, and in a close fight an opponent might try to put a hand on one's elbow or sword pommel to prevent one from doing so. In this illustration from Talhoffer's manuscript of 1459, the opponent is too slow, and the next picture shows the swordsman delivering a rising cut that takes his hand off at the wrist. Other manuals depicted men defending themselves with sheathed swords. (Hans Talhoffer/Wikimedia/Public Domain)

THE SCABBARD

Swords were carried in scabbards attached to waistbelts, or less frequently to baldrics over the shoulder. In some circumstances, scabbarded swords were carried in the hand rather than worn, with the belt wrapped around them. Scabbards protected the sword from rain and damp and protected everything else from its sharp edge.

Early medieval scabbards were blocky, made from paired wooden laths, hollowed on their insides to match the shape of the blade and glued together. They were often lined with raw fleece; the lanolin protected the sword from corrosion and pressed lightly against the blade for a secure fit. From the 14th century, scabbards became much slimmer and more closely fitted, formed from very thin wooden slats bent around the blade, and lined with thin cloth. Scabbards were then bound in leather, often dyed or painted, or covered in velvet. This was generally reinforced by a metal chape protecting the scabbard tip, and a locket at the throat, where the sword was inserted. The scabbard body might also be decorated with metal plaques. Some

scabbards included sockets for small by-knives, but this was more common on hunting blades.

The closer a sword fitted its scabbard, the more secure it was from accidental loss, but equally the slower it would be to draw. Longer swords also took longer to draw, and in close fights, a man might be better drawing his dagger. Silver advises drawing one's sword while still approaching the duelling field to avoid being surprised, while Fiore demonstrates using a scabbarded sword to defend oneself against an opponent with a dagger.

Medieval art sometimes shows men carrying swords in their hands, but without scabbards. This may simply be artists omitting something inessential, or men may actually have discarded scabbards after drawing their swords to prevent them tangling the legs. This makes sense in judicial duels, where swords would not be re-sheathed and indeed Talhoffer's 1459 fightbook actually shows discarded scabbards lying on the ground. This may not have been common practice, however.

substitutes if they could not serve themselves, and those without adequate weapons could be fined or even lose their citizen status.

Most towns did restrict when weapons could be carried, however. Soldiers obviously went armed during wartime, but swords were not generally worn as dress accessories with civilian clothes before 1500. Most cities only regarded daggers as weapons if they exceeded the 'Town measure', often carved or painted on the wall of a prominent building, and analysis of legal records shows that these – rather than swords – were the most common weapons used in fights, followed by clubs and improvised weapons. When swords were involved, the user had often returned home to get it after an earlier incident.

Certain buildings – usually churches, guildhalls and the city courthouse – were generally declared 'peaceable spaces' into which no weapons could be brought, and anyone walking the streets armed after dark was assumed to be a criminal. Carrying weapons while travelling was a sensible precaution because roads could be dangerous even in peacetime, but travellers were usually required to leave weapons at their inn once they arrived.

Rules sometimes became stricter: in 1434 the Balli of Caen in English-ruled Normandy was instructed not to admit anyone from the countryside unless they left any weapons and armour outside, after several towns were captured by French infiltrators. Restrictions were strictest in England, where royal authority was unusually strong. Even citizens were banned from carrying weapons in the City of London after dark in 1281, and everyone below the rank of knight was banned from carrying swords by day in 1326. Other English cities such as York had similar rules, as did German cities such as Nuremberg, though their frequent re-issue suggests that they were not universally followed.

Some sources mention swords being carried in rings welded directly to the skirt of a harness, which may explain the lack of scabbards on armoured figures. It is also difficult to see how the very large longswords Vadi depicts could sensibly have been carried sheathed. Presumably they were carried on the shoulder like rifles, as true two-handed swords were.

Documents sometimes refer to a second sword carried attached to the saddle, but this rarely appears in art.

Attaching a knight's sword and dagger to his breastplate by chains to prevent loss was briefly fashionable in the early 14th century, while the *Tournament Book* written by King René I of Naples mentions cords tying the sword hilt to the wrist. Neither practice seems to have been done with longswords, however, as they restricted any two-handed use.

The back scabbards beloved of fantasy art have no historical basis. They would be impractical to draw a longsword from – even at maximum arm extension, the tip would not clear the scabbard mouth – and reaching behind the head exposed the entire body as an unprotected target.



Two men fighting using armoured half-sword techniques, depicted in Talhoffer's 1459 manuscript. Their scabbards lie at their feet, discarded to avoid tangling their legs. The left figure appears to be wearing a plate gauntlet on his right hand and a leather glove on his left, and his sword has a rainguard. (Hans Talhoffer/Wikimedia/Public Domain)

Because bearing arms was an indication of status, male citizens might lose the right to do so as civic punishment for bad behaviour, including drunkenness, adultery, wife-beating and debt, often alongside being barred from other 'masculine' activities such as public drinking. Below the citizens were apprentices and servants, whose lower status was reflected in stricter restrictions on the weapons they could carry.

Like clothes, swords were covered by sumptuary legislation, which forbade people from dressing above their social station and restricted materials for scabbards and the amount of precious metal on sword hilts. Such laws became more important later, when swords were routinely worn – the Tudor statute of 1562 ordering all swords (not just rapiers) above a certain length should be 'cut down to size' also regulated the size of ruffs, showing it was about status rather than weapons regulation.

Outside the protection of walled towns, German peasants were actively expected to own – and often carry – weapons, while in England, all free men were repeatedly exhorted to practise archery on Sunday rather than waste time playing football.

HOW SHARP WERE MEDIEVAL SWORDS?

No medieval swords remain in a condition which shows how sharp they originally were, though an anonymous French text from 1446 mentions archers carrying razor-sharp two-handed swords (Anglo 2000: 210) and a Spanish text from 1444 describes a sword severing a thick rope with one cut. It can seem difficult to reconcile this – and pictures and accounts of



A sharply pointed longsword from 1500, with a blunt grip section part way down the blade. It bears a striking resemblance to the weapon described by Fiore and illustrated on page 23. (Kunstammer Vienna, KHM-Museumsverband A-168)

longswords severing limbs or heads – with half-sword techniques which clearly show sword blades gripped with bare hands.

First, not all swords were equally sharp. Records left by the executioner of 16th-century Nuremberg tell us that being beheaded with the sword ‘out of mercy’ was a privilege extended only to his more fortunate or influential clients, because it was quicker and less painful than slow hanging. He performed 187 beheadings during his career, and only a handful were botched jobs that failed to remove the head with a single cut. By contrast, the unusual late longswords depicted by Vadi appear like boar swords, blunt for much of their length. Both are examples of specialized design and use, however, rather than general weapons.

Second, blades might not be equally sharp along their whole length. Indeed, both Fiore and Vadi explicitly describe blades of swords for armoured fighting only being sharpened 6in or four fingers from the tip, respectively. This seems only to apply to these specialized weapons, however, as Fiore also describes swords sharpened for their entire length, or with a short unsharpened section one-third of the way from the point. We know that most longswords must have been sharp along most of their length, because the ‘three wounders’ of the Liechtenauer tradition include slicing moves where the blade edge is drawn across the opponent’s wrist or neck to cut, which only worked with reasonably sharp edges.

We have no evidence of medieval swordsmen practising cutting exercises like those seen in Japanese swordsmanship, however, so it is unlikely razor sharpness was required. Indeed, the sharper an edge is, the more quickly it becomes dulled and the more likely it is to be damaged in use. Razor sharpness also does not necessarily offer significant advantage in powerful cleaving cuts; an axe may not be as sharp as a scalpel, but will cut down trees better.

Modern HEMA demonstrations show that reproduction longswords with reasonably sharp edges – roughly equivalent to modern kitchen knives – are entirely capable of inflicting cuts to animal carcasses that will sever limbs and spines, if well delivered with the correct portion of the blade. The same reproductions were then used to demonstrate half-sword techniques, stabbing the points into unyielding wooden blocks without injury to the wielder, provided they maintained good grip and did not allow the sword to slide in the hand. Equally, seizing an opponent’s blade – shown in several fightbooks – is entirely feasible if done from the bind, where the blade’s momentum has been stopped by the parry.

Any sword used in combat would have its edge damaged to some extent, from parrying other weapons, or when striking bone, armour or shield rims. Ultimately, medieval swords were weapons that could be replaced after a fight if necessary. At worst, the longsword’s symmetrical double-edged design let the user simply turn it over in his hand, use the other edge as the primary for the remainder of the fight and re-sharpen the blade afterwards.

WOUNDING EFFECTS

Swords are ultimately intended to kill people. Although there are other options such as strikes with the pommel or cross, German sources talk of



A battle depicted in a Swiss chronicle, c.1483. The figure at centre left is clearly able to use his longsword one-handed, while the figure on the right has a single-edged *Kriegsmesser* ('war knife'). (Burgerbibliothek Bern, Mss.h.l.1, p.153 – Diebold Schilling, Amtliche Berner Chronik, vol. 1)

the 'drei Wunder' ('three wonders/three wondrous'): the cut, the thrust and the slice. Peter von Danzig tells us that we should take care not to strike when we should stab, not slice when we should strike, and not stab when we should slice. Which you chose was driven partly by relative position of the combatants and any armour worn, but also to maximize your own chance of survival – lethal blows were not necessarily immediately incapacitating, and could leave an opponent able to deliver his own lethal counterstrike against you before dying. Swords were also optimized differently: an acutely pointed thrusting sword could cut, but not as well as less tapered ones.

The slice – pressing the edge of the blade against the opponent's flesh and then drawing it across the surface in a pushing or pulling motion like slicing a turkey – was the least important category of wound. It was unlikely to be effective against flesh covered by heavy clothing, let alone fabric or metal armour. Instead, it was usually delivered from swords crossed in the bind against the opponent's neck or his unprotected wrists; successfully severing the tendons immediately removed his ability to hold weapons and continue fighting or defend himself from further attacks.

The thrust could be delivered with both hands on the hilt, or from a half-sword grip. A thrust was generally the only way to hurt armoured men directly, while easily penetrating clothing and skin because the whole force of the blow was concentrated into the small area of the tip. Effectiveness depended heavily on target location, but the human proclivity for interpersonal violence gives us plentiful medical evidence to understand this.

THE FEDERSCHWERT

Federschwerter – German for ‘feather-swords’ – were specialized practice weapons associated with the ‘sport fighting’ of the German *Fechtschulen*, though examples are known from elsewhere. They appeared in the 1430s, but became most common in the late 15th and 16th centuries. The term itself was not used in the period, and its current usage stems from a Victorian belief it was the favoured weapon of the *Federfechter*, who may have gained their name from quite different routes. Where the word *Federschwert* actually occurs in the period, it described fighting with the quill pen: the medieval equivalent of ‘keyboard warrior’.

Practice swords needed thick edges to minimize sparring injuries, but to avoid making blades excessively heavy *Federschwerter* were made with narrow blades and thick edges – essentially the same amount of metal as sharp swords, but redistributed. The narrow

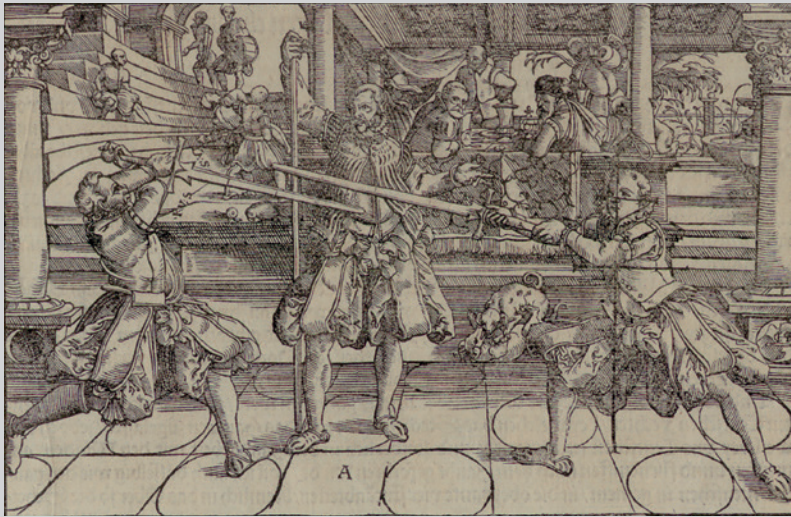
blade flared out into a wider *Schild* (‘shield’) near the cross, reinforcing an area prone to breakage on narrow blades and allowing binding moves like those done with sharp swords. This also moved the centre of mass toward the hand, improving point control and reducing the impact from cuts. Points were blunted or turned over (‘foiled’) to prevent injury. Despite this, sporting contests with *Federschwerter* were not risk free – they were commonly fought until one participant had a bleeding cut on their scalp, and fighters being blinded in one eye or even killed was an occasional hazard.

Many *Federschwerter* are rather long for single-handed use, and may be better regarded as short two-handed swords, rather than longswords. The grips seem particularly long, either for leverage or to allow use in padded gloves, which are sometimes shown in period art.

Thrusts to the torso could break or displace any ribs in the way. They might pierce the heart, which was highly likely to be fatal: medical evidence suggests roughly one-third of such victims die or are incapacitated immediately, with the remainder taking a minute or more to die, and very few remaining conscious longer. Torso thrusts were more likely to pierce a lung, which was unlikely to be immediately fatal, but likely to produce pneumothorax (where air entering the chest cavity leads to the lungs collapsing as air fills the space with each successive breath) or haemothorax (bleeding into the lungs so the victim drowns in his own blood). Either was probably fatal within an hour or two, given the inability of medieval medicine to treat wounds to the chest cavity. Such severe wounds would also continually degrade the victim’s fighting ability as his cardiovascular system was overwhelmed, but neither would necessarily cause immediate incapacitation. Serious thrusts to the abdomen were also generally beyond the ability of medieval medicine to treat, and highly likely to be fatal either via blood loss (which might take minutes, or might take several days) or infection (probably several days) but again did not immediately incapacitate.

Though often recommended to make opponents flinch back, thrusts to the head were not always as effective as might be expected. A thrust hitting an eye would partially blind an opponent, and offered an easy channel into the brain, with usually immediate fatal results. Thrusts to the face below the eyes were disconcerting and disfiguring but unlikely to cause physical incapacitation, while thrusts above the eyes would strike the thick, strong bone of the forehead and were more likely to deflect across its surface than to penetrate. Thrusts to the limbs pushed muscle bundles apart rather than severing them. Such injuries weakened and slowed victims, but would not put them out of the fight immediately unless they broke major bones.

Overall, thrusts were deadly. Although Vadi compares such blows to the stings of a scorpion, he is concerned that one might deliver a lethal thrust to one’s opponent, but then be unable to defend against a counter-



A woodcut from Meyer's 1570 longsword manual, *Thorough Descriptions of the Art of Fencing*, showing the flared *Schildt* ('shield') shapes near the hilt of the *Federschwert* ('feather-sword') and the 'stickler' with his staff. The lines on the swords may be to indicate points of crossing. The setting is an artistic trope, rather than a realistic depiction of a fencing school of the period. (Bayerische Staatsbibliothek München, Res/4 Gymn. 26 t, fol.IIIr.)

attack delivered before he goes down. He notes that if your sword cannot be withdrawn swiftly after a thrust, your opponent is given an opportunity to strike back (Windsor 2018: 179–80).

The longsword could deliver very powerful two-handed cuts, turning the hips and shoulders to put maximum momentum into them. Their effectiveness also depended on target location, but with rather different results to thrusts. It was difficult to deliver good, effective cuts to the opponent's torso. Their limbs tended to get in the way, and it was very likely he would have at least some armour; even padded jacks offered surprising protection from cuts, though little versus thrusts. The ribcage was also much more effective at protecting internal organs, because it tended to flex as a unit under cutting impacts even if some ribs cracked or broke in the process. Generally, thrusts (which broke or displaced individual ribs and penetrated the abdomen more deeply) were a better choice against the torso.

By contrast, cuts to the head generally impacted the sides, rear or top of the skull where the bone was much weaker and good, well-delivered cuts had a decent probability of being both fatal and immediately incapacitating. Even cuts which failed to incapacitate immediately might stun, leaving the victim open to follow-up cuts. The head was thus a priority target and most soldiers wore some form of head protection if they could.

Cuts to limbs would only be fatal in themselves if arteries were severed and the victim bled out before a tourniquet could be applied, or if they became infected later. Good limb strikes could be immediately incapacitating, however, either by severing tendons, by breaking the long bones or by cutting the large muscle groups. Even cuts which only partly achieved these things would leave the opponent easy prey for follow-up attacks.

Period accounts and fightbook illustrations both show heads and limbs being completely severed. Even allowing for artistic exaggeration,

this seems a realistic if not necessarily likely possibility. Tests with modern reproductions against animal carcasses do not fully replicate the difficulties of cutting well against moving targets, but clearly show that good cuts could potentially sever limbs. Archaeological evidence suggests one body from the Visby mass grave had both legs severed by a single cut.

Other moves such as pommel strikes or grappling holds rarely inflicted significant damage themselves, but pommel strikes might stun, and unbalanced or pinned foes were vulnerable to the next attack.

Any analysis of combat wounds must recognize that fights are unpredictable, and the comments above can only be generalizations. One fighter might be overcome with shock and fear, huddling under a rain of blows when cold analysis says he should still be fighting effectively. Another, driven by rage and adrenaline, might keep coming despite wounds that should have killed him already. A cut on the forehead might not be dangerous in itself, but blood flowing from it could blind a fighter for the split second his opponent needed to land another cut. Even hits that knocked a man down but failed to penetrate his armour could still be fatal, as the victim – perhaps stunned or winded – was easy meat for his opponent until he regained his feet.

Medieval warriors often had financial incentive to capture rather than kill knightly opponents, because prisoners could be ransomed. The sums involved could be considerable, even after giving one's immediate lord and the king their customary shares, as a man's ransom might be equivalent to several years' income from his estates. Sir John Gray of Ruthin, serving at the battle of Agincourt with a modest retinue, sold his rights from the capture of Charles, Count of Eu, to the king for 1,000 marks, equivalent to perhaps £10m today. The custom was sufficiently well established that knights who killed prisoners taken by another were liable for the captor's lost income. It was obviously far easier to batter men in decent armour into submission without killing them in the process than lightly armoured common troops. These were also unlikely to be worth ransoming financially, as seen in the massacre of the English rank-and-file at the battle of Formigny in 1450. Of course, this cosy system sometimes broke down, even for the wealthy. Military necessity forced King Henry V of England to massacre valuable French prisoners at Agincourt in 1415, after rumours of a French rally. The Swiss were notorious – and feared – because they rarely took ransoms. Equally, ransom was much rarer in civil wars; the victorious Yorkists executed several prominent Lancastrian lords captured at the battle of Tewkesbury in 1471, for example.

SKELETAL EVIDENCE OF MEDIEVAL COMBAT

Several studies looked at bone assemblages from medieval battles. Identifying medieval skeletons with apparent injuries does not automatically mean the individuals died in battle, rather than (for example) murder, execution or even accident such as falling from a horse. Studies have thus focused on mass-grave pits associated with particular battles, notably Visby (Sweden, 1361), Towton (England, 1461) and

THE SWORD AS A SYMBOL

Humanity created many weapons over the years, but none acquired quite the symbolic resonance of the sword. In the Early Middle Ages (400–900), costly weapons such as Charlemagne's 'Joyeuse' or Beowulf's fictional 'Hrunting' marked men as leaders. Though swords fell in price, they remained key symbols of knighthood, along with the spurs symbolizing equestrian prowess. Indeed, swords played a key part in the increasingly elaborate 'dubbing' ceremonies by which a man became a knight, with his sword belt being girded round him and (in some versions) the flat of the blade used to deliver the ritual blow (*colée*) upon on his shoulders before he rose as a knight.

After the knight's death, his sword and helmet might be placed over his tomb to show his status, while the sword came to symbolize the knightly class in the playing cards which appeared in the 14th century (as the spade, from the Italian *spada*) alongside cups, coins or clubs for nobles, merchants and peasants, respectively. Swords also symbolized worldly power. Monarchs or powerful nobles might have large 'bearing swords' carried before them in procession on formal occasions, or give 'Swords of State' to towns granted legal privileges.

The sword's cruciform shape carried obvious religious symbolism, made very explicit as knighthood gained quasi-mystical trappings, and the two edges were often given allegorical interpretations. Oaths might be sworn on sword hilts, while art sometimes depicted knights holding their swords before them like crucifixes, or kissing the cross of the sword to show religious devotion. In the Arthurian romances popular in the period, Arthur

proved his worthiness and right to rule by drawing the Sword in the Stone, and his later weapon Excalibur is undoubtedly the most famous sword of all. The sword symbolized war long after it had been eclipsed by other weapons; enemies were still 'put to the sword', regardless of the weapons actually used.



King Henry VI of England appoints John Talbot, Earl of Shrewsbury, as Constable of France by presenting him with a sword in a miniature from a 1445 book of romances. (© British Library Board/Bridgeman Images, Royal 15 E.VI, f.405)

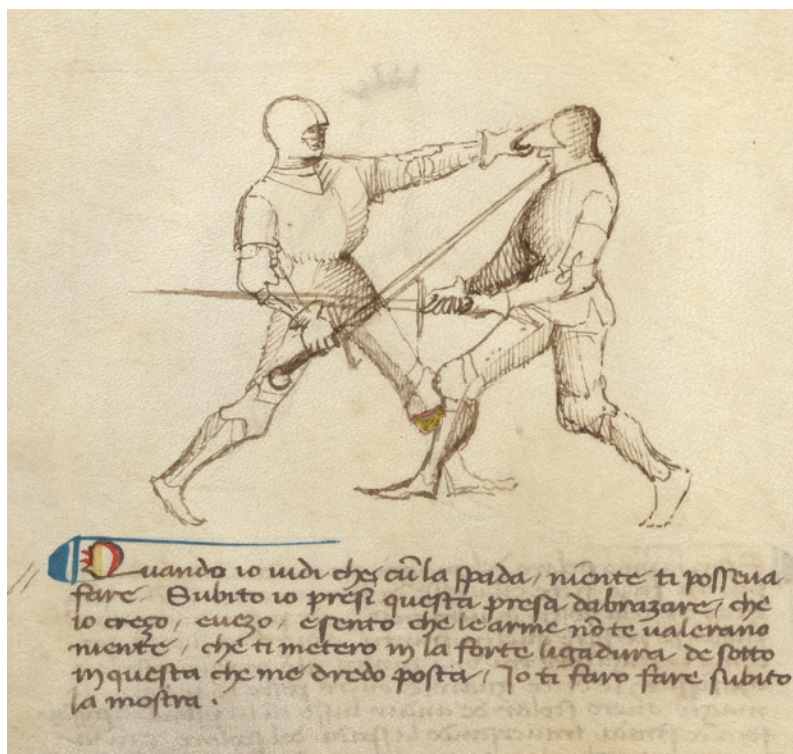
Uppsala (Sweden, 1520), where reasonable numbers of skeletons have been recovered. There are some obvious caveats with this data, however.

First, the people in grave pits are obviously those who did not survive the fight. Some were simply unlucky, but our starting sample may contain disproportionate numbers of those who were poorly equipped or fought badly.

Second, skeletal remains cannot show wounds which only affect soft tissue, killing or incapacitating individuals without striking bone. For comparison, a study of arrow wounds received by US soldiers during the 19th-century 'Indian Wars' found only 30 per cent struck bone (Smith 2017: 30). We could thus mistake someone mortally wounded by an arrow in the belly and 'finished off' later as being killed by a sword cut to the head. Wound marks are also more noticeable on the smooth curve of skulls than on (for example) ribs, and skulls themselves are more likely to survive reasonably intact and be recovered than smaller bones.

Third and most important, our limited knowledge about the combat situation where these men died complicates analysing the wound patterns. For example, two explanations proposed for the disproportionate number of lower leg wounds at Visby were that they were cavalrymen fighting

As the face and head were important targets, one of Fiore's armoured techniques involves stepping out of the opponent's line of attack, lifting his visor with the off-hand, and thrusting to his face one-handed. (Sepia Times/ Universal Images Group via Getty Images)



infantry, or (more plausibly) that they were infantrymen fighting with large shields which protected their bodies but not their legs.

Equally, the high percentage of head wounds among the Towton sample seems odd given evidence that most English foot soldiers of the period wore some form of helmet, suggesting they were either killed during the post-battle rout, attacked from above by pursuing horsemen after discarding helmets and equipment as they fled, or that they were stripped of their armour and executed after capture.

Despite the caveats, several interesting patterns emerge. The first and most obvious is the divide between Visby (with large numbers of lower leg wounds) and the later samples (with strong predominance of head wounds). Given the old-fashioned equipment we know the Visby casualties wore (because many were buried in their armour), it seems plausible that the discrepancy stems from the known change in close-combat styles from single-handed weapon and shield to two-handed weapon (longsword, polearm, pollaxe) without shield.

Second, many skeletons show multiple injuries received at the same time, with the Towton samples in particular averaging 4.2 wounds to the skull alone, without allowing for archaeologically invisible soft-tissue wounds. This seems consistent with victims going down under a brutal rain of head blows to finish them, after an initial blow removed or reduced their ability to defend themselves.

Lastly, some victims showed healed injuries, including a severe sword cut to the face. This indicates previous combat experience, though this clearly did not help them in their subsequent fight.



CONCLUSION

The longsword became popular because it suited the tactical and social environment of the time. When this changed, it lost its popularity and was replaced by weapons better suited to the new conditions. The key technical change was the rise of gunpowder weapons. Projectile weapons had always existed on the medieval battlefield, and English tactics in particular were built around longbow archery throughout the period of the longsword's popularity. Indeed, longbows were better weapons than muskets until after the battle of Waterloo (1815), with equivalent range and better rate of fire. So why did guns lead to the disappearance of the longsword, when longbows had not?

First, early guns such as the arquebus were inaccurate and slow to reload, but had two key advantages. They were very hard-hitting, with bullets that penetrated plate harness far more dependably than arrows or crossbow bolts. It was possible to make armour arquebus-proof, but only by making it too heavy for general use. While armour did not disappear immediately, its use declined and with it the need for weapons optimized to fight against it, such as the longsword and pollaxe. Cavalry, unable to charge home against the new 'pike and shot' blocks, armed themselves with pistols and single-handed swords or sabres that no longer needed to defeat armour. Also, whereas good archers trained from boyhood to develop the strength and skill required, guns were simple enough that men could learn to use one in a few days. Similarly, crossbows had been available previously, but their steel bows and geared winding devices made them expensive weapons, whereas once artificial saltpetre beds were invented in the 15th century, guns and powder became relatively cheap. This allowed armies to deploy large numbers of missile troops, and changed warfare to a 'pike and shot' model where shooting played a much larger part in determining the outcome.

Some longswords grew into true two-handed weapons such as the *Zweihänder* used by elite *Doppelsöldner* ('double pay men') in the front



Johannes Liechtenauer as depicted in the 1452 Codex Danzig 44.A.8. This is often erroneously attributed to Peter von Danzig, who actually contributed only a small proportion. Note the large single-edged *Kriegsmesser*, used with the same technique as the longsword beside it. (Peter von Danzig zu Ingolstadt/Wikimedia/Public Domain)

OPPOSITE

Being executed with the sword was regarded as more merciful and less socially demeaning than other methods, and the victim or the victim's family might use their remaining influence to gain this small mercy. The classic heavy and blunt-tipped execution sword did not appear until the Renaissance, but normal longswords were regularly able to remove heads with one well-delivered cut, as shown in this manuscript miniature. (DeAgostini/Getty Images)

rank of landsknecht pike blocks, to hack their way into opposing blocks by cutting enemy pikes or battering them out of the way. The close fighting when two such blocks met favoured shorter cut-and-thrust swords, however, and the *Zweihänder* enjoyed a relatively brief period of battlefield use. Like their equivalents, the Iberian *montante* and the Italian *spadone*, their impressive appearance and utility in dealing with multiple enemies meant some remained in use as specialist weapons for colour guards or the personal bodyguards of kings and nobles.

As swords became less important on the battlefield, they became more important in civilian life. Social customs changed so swords were routinely worn with civilian dress, which was uncommon before the 16th century, and exaggerated codes of honour led to duels – previously restricted to legal occasions – now being fought over any perceived slight.

Longsword fights had always included thrusts, but with armour no longer a concern the single-handed rapier became fashionable. Indeed their elaborate hilts became fashion items in themselves. Early rapiers remained cut-and-thrust weapons, though the lighter blade reduced the effectiveness of cuts. Eventually, rapiers transformed into lighter, quicker blades, ultimately becoming the pure thrusting smallsword of the 17th century. Meanwhile, new fencing styles concentrated almost solely on the gathering step, with extensive use of the lunge.

The rapier was too specialized for battlefield use and was at a disadvantage against anything except another rapier even in single combat. In England, Silver fulminated against both the new weapon and its Italian teachers, who were allowed to teach without being subject to the authority of the traditional English Masters of Defence. He cheerfully describes Rocco Bonetti ('Signior Rocko') – an Italian fencing master living in London – being challenged by an Englishman called Austen Bagger, armed with sword and buckler. Despite making his living teaching the rapier, Bonetti preferred a two-handed sword (probably a longsword in our terms) for a serious fight, though it did him little good and he was soundly beaten.

These limitations did nothing to reduce the rapier's popularity, and it became extremely fashionable as a civilian duelling weapon. While the longsword continued as a sport fencing weapon alongside it, Meyer noted in 1570 that the art was almost dead. Shakespeare reflects this changing fashion in *Romeo & Juliet* (1595); the duellist Tybalt carries a fashionable rapier, but when old Capulet is alarmed, he calls for his longsword.

The last fightbooks in the Liechtenauer tradition were produced by Jakob Sutor in 1612 and Theodor Verolini in 1679, both heavily based on

Meyer. Apart from some Victorian interest – mostly from fencers reconstructing the origins of their sport – and a bizarre and short-lived revival for the Hitler Youth in 1935 using a simplified version of Meyer, these were the last major works on the longsword until the rebirth of interest in historical swordplay at the end of the 20th century.



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A knight uses a longsword to kill a giant in the 'Alphonso Psalter' commissioned c.1284 to celebrate the proposed marriage of Alphonso, son of King Edward I of England (r. 1272–1307). (© British Library Board/Bridgeman Images, Add.24686, f.17)

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Further reading

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 www.fioredeiliberi.org
 www.guywindsor.net/blog
 www.hemaalliance.com
 www.hroarr.com
 www.keithfarrell.net
 www.talhoffer.blogspot.com
 www.thearma.org

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Editor's note

Imperial units of measurement (inches, feet, yards, pounds and ounces) are used in this book. In medieval England, one pound (£) contained 20 shillings (s) each of 12 pennies (d).

The Royal Armouries

The Royal Armouries is Britain's national museum of arms and armour, and one of the most important museums of its type in the world. Its origins lie in the Middle Ages, and at its core is the celebrated collection originating in the nation's working arsenal, assembled over many centuries at the Tower of London. In the reign of Queen Elizabeth I, selected items began to be arranged for display to visitors, making the Royal Armouries heir to one of the oldest deliberately created visitor attractions in the country. The collection is now housed and displayed at three sites: the White Tower at the Tower of London, a purpose-built museum in Leeds, and Fort Nelson near Portsmouth. To find out more, explore online at collections.royalarmouries.org

Dedication

In memory of Roger Lankford – swordsmith, gentleman and friend.

Acknowledgements

I would like to thank the following people, all of whom helped with this book in various ways. It is a better book thanks to their help, though any remaining errors are obviously my own: Mike Cooper, Myk Dormer, Keith Farrell, Peter Johnsson, Hugh T. Knight, Jr, Mark Lancaster, Richard Marsden, Gregory D. Mele, Helen Millington-Evans, Bruno Nicolletti, Herbert Schmidt, Ann Tlusty, Ailsa Whyte, Dr Guy Windsor.

Author's note

Terminology is difficult when discussing medieval weaponry. Just as Napoleonic riflemen of 1815, World War I 'Tommies' of 1915 and infantrymen in Afghanistan in 2015 all described the very different weapons they carried as 'rifles', medieval writers used very general terms such as 'sword' or more specific descriptions that may or may not mean the same when used by another writer. These terms included *grans espée*, 'grete swerdes' or 'long swerdes' (large or long swords), *espée à deux mains*, 'twahandswerdes' or *spada a dui mani* ('sword in two hands'), and *espée de guerre* ('war sword') or 'bastard swords' (longer than short swords, but shorter than longswords), but these terms are not explained or used systematically, and undoubtedly cover a range of sub-types.

In this book the term 'longsword' is used for all swords light enough to use one-handed, but with grips long enough to allow two-handed use if desired. The blade might be longer than that of a sword designed purely for single-handed use (often termed the 'knightly sword' or 'arming sword') but need not be; the key difference was the longer grip. Equally, such weapons were generally shorter than true 'two-handed swords' such as the German *Zweihänder*, which were neither light enough nor properly balanced for plausible single-handed use.

Cover illustrations are (top) a longsword of the early 15th century with modern wooden grip; the original tip has been lost to corrosion (© Royal Armouries IX.2149), and (bottom) © Osprey Publishing.

Title-page illustration: The *Marxbrüder*, the famous German guild of professional fencing masters (see page 58), made use of a sword-armed version of the lion conventionally used to symbolize their patron, the evangelist Saint Mark, in this manuscript of c.1495. The manuscript was created by Peter Falkner, who was elected *Hauptmann* (captain) of the guild in 1502. (Peter Falkner/Wikimedia/Public Domain)

Artist's note

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